Clark University,

in the City of Worcester,

Massachusetts.

Register and ~~Seventh~~ Official Announcement.

2-95

1895.

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CLARK UNIVERSITY,

WORCESTER, MASS.

REGISTER

AND

Fifth Official Announcement.

WORCESTER, MASS.:
PUBLISHED FOR THE UNIVERSITY.
May, 1893.

CALENDAR: 1893-94.

1893.

JUNE 22. Thursday. Present academic year ends.

SEPT. 27. Wednesday. Fifth academic year begins.

DEC. 23. 1894. JAN. 2. } Christmas Recess.

Date of the Spring Recess and close of next academic year to be determined later.

MEMBERS.

G. STANLEY HALL, PH. D., LL. D., President of the University. 94 Woodland St.

A. B., Williams College, 1867, and A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-1881; Professor of Psychology, Johns Hopkins University, 1881–1888; LL. D., University of Michigan, 1888; and Williams College, 1889.

WILLIAM E. STORY, PH. D., Professor of Mathematics. 17 Hammond St.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CLIFTON F. HODGE, PH. D., Assistant Professor of Physiology and Neurology. 11 Tirrell St.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92.

EDMUND C. SANFORD, PH. D., Assistant Professor of Psychology. 21 Oread Place.

A. B., University of California, 1883; Fellow of Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888.

HENRY TABER, PH. D., Assistant Professor of Mathematics. 9 Oread Place.

A. B., Yale (Sheffield Scientific School), 1882; Ph. D., Johns Hopkins University, 1888; and Assistant in Mathematics, Johns Hopkins University, 1888-89.

ARTHUR G. WEBSTER, PH. D., Assistant Professor of Mathematical Physics. 936 Main St.

A. B., Harvard, 1885, with honors in Mathematics and Physics; Instructor in Mathematics, Harvard, 1885-86; Parker Fellow, 1886-89; Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890.

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WILLIAM H. BURNHAM, PH. D., Instructor in Pedagogy. 100 Chatham St.

A. B., with honors in Philosophy, Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor in the State Normal School, Potsdam, N. Y., 1883-85; Fellow Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89.

SAMUEL P. MULLIKEN, S. B., PH. D., Instructor in Chemistry. 100 Chatham St.

S. B., Mass. Institute of Technology, 1887; Assistant in Chemistry, University of Cincinnati, 1887-88; Ph. D., University of Leipzig, 1890; Fellow in Chemistry, Clark University, 1890-91; Associate in Chemistry, Bryn-Mawr College, Bryn-Mawr, Pa., 1891-92.

A. F. CHAMBERLAIN, PH. D., Lecturer in Anthropology. 20 Grand St.

B. A., University of Toronto, Canada, 1886; M. A., University of Toronto, 1889; Fellow (tutorial and post-graduate work) in Modern Languages in University College, Toronto, 1887-90; Examiner in German in University College, and the University of Toronto, 1888-92; Examiner in Modern Languages in the University of Trinity College, Toronto, 1890-91; Examiner in French and German, Department of Education, Ontario, 1888-89; Anthropological Researches in British Columbia under the auspices of the British Association for the Advancement of Science, summer of 1891; Fellow of the American Association for the Advancement of Science.

BENJAMIN IVES GILMAN, A. M., Instructor in Psychology. 12 Oread St.

A. B., Williams College, 1872; A. M., 1880; Fellow of the Johns Hopkins University, 1881-83; Lecturer at Princeton, Harvard and Columbia Colleges, 1890-91.

ARTHUR A. NOYES, PH. D., Lecturer in Physical Chemistry. 1892-93.

S. B., Mass. Institute of Technology, 1886; and M. A., 1887; Instructor in Analytical Chemistry, Mass. Institute of Technology, 1887-88; Student University of Leipzig, 1888-90; Ph. D., Leipzig, 1890; Instructor in Chemistry, Mass. Institute of Technology, 1890-93.

JOSEPH DE PEROTT, Docent in Mathematics. 13 Woodland St.

Universities of Paris and Berlin, 1877-80.

THADDEUS L. BOLTON, A. B., Demonstrator and Fellow in Psycholygy. 53 Eastern Ave.

A. B., University of Michigan, 1889; Principal Public Schools, Vulcan, Mich., 1889-90.

THOMAS H. CLARK, B. S., PH. D., Worcester, Mass., Assistant in Chemistry. 22 Lancaster St.

B. S., Polytechnic Institute, Worcester, Mass., 1880; Johns Hopkins University, 1883; Assistant in Chemistry, Wesleyan University, Middletown, Conn., 1886-89; Ph. D., Clark University, 1892.

B. C. HINDE, A. M., Assistant and Fellow in Physics. 1018 Main St.

A. B., Central College (Mo.), 1881, and A. M., 1882; Instructor in Physical Sciences, Howard College, 1882-88; Johns Hopkins University 1888 90; Professor of Physics and Chemistry, Mo. State Normal, 1890-91; Professor of Physics, Trinity College, N. C., 1891-92.

H. AUSTIN AIKINS, PH. D., Toronto, Ont., Fellow in Psychology. 1018 Main St.

B. A., University of Toronto, 1887; Instructor in University of Southern California, 1888; Yale University, 1888-91; and Lecturer on History of Philosophy in Yale, 1890-91; Ph. D., Yale, 1891; Professor of Logic and Philosophy in Trinity College, N. C., 1891-92.

THOMAS P. BAILEY, JR., PH. D., Fellow in Psychology. 625 Main St.

B. A., South Carolina College, 1887; Tutor in English and History, University of South Carolina, 1888-89; M. A., 1889 and Ph. D., 1891, University of South Carolina; Adjunct Professor of Biology, South Carolina College, 1891-92.

J. A. BERGSTRÖM, A. B., Middletown, Conn., Fellow in Psychology. 5 Gates St.

A. B., Wesleyan University, 1890.

WM. L. BRYAN, A. M., Bloomington, Ind. 23 Benefit St.

A. B., Indiana University, 1884, and A. M., 1886; Berlin University, 1886-87; Instructor, Associate and Professor of Philosophy, Indiana University, 1885 to present. Absent on leave.

F. B. DRESSLAR, A. M., Banta, Ind., Scholar in Psychology. 23 Benefit St.

A. B., University of Indiana, 1889; A. M., 1892; Instructor in Vincennes University, 1888; Principal of High School, Princeton, Indiana, 1889-90; and Superintendent of City Schools, 1890-91; Assistant in Philosophy, Indiana University, fall term, 1892.

JOHN H. GRAY, JR., B. S., Berkeley, Cal., Fellow in Chemistry. 70 Florence St

B. S., University of California; Assistant to State Analyst (of California), 1887-90; Assistant in Chemistry, University of California, 1889-90; Instructor in Chemistry, University of California, 1890-92.

T. PROCTOR HALL, PH. D., Fellow in Physics. 12 Woodbine St.

B. A., University of Toronto, 1882; Fellow and Instructor in the Chemical Laboratory, University of Toronto, 1883-84; F. C. S. (Eng.), 1885; M. A., Ph. D., Illinois Wesleyan University, 1888; Science Master, Woodstock College, Woodstock, Ontario, 1885-90.

THOMAS F. HOLGATE, M. A., Foxboro, Ont., Canada, Fellow in Mathematics. 17 Freeland St.

B. A., Victoria College, Toronto, 1884; M. A., 1889; Mathematical Master, Albert College, Belleville, Ont., 1884-90.

FREDERICK TRACY, A. B., Claremont, Ont., Fellow in Psychology. 15 Florence St.

Pickering College, 1883; Commercial Master in Pickering College, 1885; A. B., University of Toronto, 1889; Fellow in Philosophy, University of Toronto (lecturing and post-graduate work), 1889-92; Examiner in Philosophy, University of Toronto, 1890-92.

CHARLES WALKER, B. C. E., M. A., Knoxville, Tenn., Fellow in Chemistry. 4 Crown St.

B. C. E. and B. App. Ch., University of Tenn., 1885; and M. A., 1886; Assistant Professor of Chemistry and Physics, University of Tenn., 1886-88; Assistant in Chemistry, U. S. Naval Academy, Annapolis, Md., 1889-90.

OSCAR CHRISMAN, A. B., Gonzales, Texas., Fellow in Pedagogy. 19 Shirley St.

Teacher in Public Schools of Indiana, 1876-83; and Principal, 1883-85; Indiana State Normal, 1887; A. B., Indiana University, 1888; Principal of Longfellow School, Houston, Tex., 1888-89; Superintendent of Public Schools, Gonzales, Tex., 1889-92.

ARTHUR H. DANIELS, B. D., Millis, Mass., Fellow in Psychology. 1018 Main St.

B. A., Olivet College, 1887; Student at the Yale Divinity School, 1887-90; and B. D., Yale University, 1890; Student of Philosophy and Psychology, Yale University, 1890-92.

ROBERT K. DUNCAN, A. B., Toronto, Ontario, Fellow in Chemistry. 9 Maywood St.

A. B., University of Toronto, 1892. First class honors, Physics and Chemistry.

JOHN E. HILL, PH. B., Fellow in Mathematics. 44 Richards St.

Ph. B., Yale University, Sheffield Scientific School, 1885; Resident Engineer C. M. and St. Paul R. R., 1885-88; Professor of Mathematics, Louisville Military Academy, Louisville, Ky., 1888-89; Superintendent of Schools, Pleasantville and Pleasantville Station, N. Y., 1889-90; Professor of Mathematics and Civil Engineering, Highland Park College, Des Moines, Iowa, 1890-92.

EDWIN F. NORTHRUP, A. B., Philadelphia, Pa., Fellow in Physics.

A. B., Amherst College, Amherst, Mass., 1891; Post-Graduate Student at Cornell, 1891-92; Resigned the fellowship to accept a position as member of the experimental corps employed by Queen & Co., Philadelphia, 1892-93.

CLARENCE ARTHUR SAUNDERS, M. A., Florenceville, N. B., Canada, Fellow in Physics. 15 Florence St.

B. A., King's College, Windsor, Nova Scotia, 1885; M. A., Nova Scotia, 1888; Johns Hopkins University, 1889-92; Assistant to Prof. Langley, Smithsonian Institution, 1891-92.

J. B. WEEMS, B. S., Solomons, Md., Fellow in Chemistry. 70 Florence St.

B. S., Maryland Agricultural College, 1888; Instructor in Mathematics and Chemistry, Maryland Agricultural College, 1889; Graduate Student, Johns Hopkins University, 1889-91.

L. WAYLAND DOWLING, Adrian, Mich., Scholar in Mathematics. 15 Florence St.

Adrian College, 1889-90; Principal of Schools, Clayton, Mich., 1891-92.

FRANK DREW, A. M. 70 Florence St.

Superintendent of Schools, Genoa, Ill., 1887-89; A. B., Indiana University, 1890; A. M., 1891.

BENJAMIN F. ELLIS, A. B., Peoria, Ill., Scholar in Physics. 70 Florence St.

A. B., with honors in Physics, Dartmouth, 1889; Instructor in Physics and Mathematics, High School, Peoria, Ill., 1889-92.

R. C. HOLLENBAUGH, PH. D., Williamsport, Pa., Scholar in Psychology. 14 Crystal St.

A. B., Bucknell University, 1888; A. M., Bucknell University, 1891; Principal of Cross Creek Academy, 1888-89; Principal of Fultonham Academy, 1889-91; Ph. D., Wooster University, 1891; Student at Johns Hopkins University, 1892.

HERBERT G. KEPPEL, A. B., Zeeland, Mich., Scholar in Mathematics. 15 Florence St.

A. B., Hope College, Holland, Mich., 1889; Teacher of Mathematics, Northwestern Classical Academy, Orange City, Iowa, 1891-92.

J. S. LEMON, A. M., Gardner, Mass., Scholar in Psychology. 8 King St.

A. B., Wesleyan University, 1864; A. M., 1867; Principal of Brownville High School, Professor of Physics, Marion Institute, Principal of Almond Collegiate Institute, Principal of Macedon Academy, all in New York; since 1880, Episcopal Rector and Editor of the Religious Department of the *National Tribune*, Washington, D. C.

JAMES H. LEUBA, B. S., PH. B., Scholar in Psychology. 8 King St.

B. S., Neuchâtel, Switzerland, 1886; Ph. B., Ursinus College, Pa., 1888; Teacher of the French Language, St. Mark's School, Southboro, Mass., 1891-92.

SIDNEY J. LOCHNER, A. B., Lockport, N. Y., Scholar in Physics. 16 Dale St.

A. B., Union College, 1890; Assistant Astronomer, Dudley Observatory, 1889-92.

JINZO NARUSE. 45 Shelby St.

Yamaguchi Normal School, 1879; Principal of the Public Schools, 1880-81; Teacher of Female Seminary, Osaka City, 1882-86; Pastor of two Christian Churches in Japan, 1886-88; President of Female Seminary of Nügata City, 1887-90; Andover Theological Seminary, 1890-92.

THOMAS F. NICHOLS, A. B., Brunswick, Me., Scholar in Mathematics. 4 Lowell St.

A. B., Bowdoin, 1892.

F. E. STINSON, Scholar in Mathematics. 84 Woodland St.

Iowa Agricultural College, 1884-86; Principal of the Poplar Grove (Ark.) Institute, 1889-90; Teacher of Physics and Mathematics, Paris (Ark.) Academy, 1890-92.

EDWARD W. FLAGG, Potsdam, N. Y. 100 Chatham St.

A. B., Yale, 1878; A. M., Yale, 1890; Teacher of English, State Normal School, Potsdam, N. Y., 1883-93.

W. J. WAGGENER, A. M., Boulder, Col., Scholar in Mathematics and Physics.

A. B., State University of Arkansas, 1876, and A. M., 1884; Professor of Natural Philosophy, State University of Colorado, 1885 (to date).

ERVIN W. HOWARD, S. B., Physics (Course d). 279 Pleasant St.

S. B., Mech. Engineering, 1892; Assistant in Physics, Wor. Polytechnic Institute.

WILLIAM NELSON, S. B., Physics (Course d). 17 Kendall St.

S. B., Mech. Engineering, 1892; Graduate Student in Electrical Engineering, Wor. Polytechnic Institute.

JOSEPH O. PHELON, S. B., Physics (Course d). 8 Dix St.

Instructor in Physics and Electrical Engineering, Wor. Polytechnic Institute.

ARTHUR L. RICE, S. B., Physics (Course d). 689 Main St.

S. B., Mech. Engineering, 1891; Instructor in Mechanical Engineering, Wor. Polytechnic Institute.

STANLEY H. ROOD, S. B., Physics (Course d). 30 John St.

Instructor in Physics, Wor. Polytechnic Institute.

CLAYTON O. SMITH, S. B., Physics (Course d). 206 West St.

S. B., Mech. Engineering, 1892; Assistant in Physics, Wor. Polytechnic Institute.

HUGH M. SOUTHGATE, S. B., Physics (Course d). 23 May St.

S. B., Mech. Engineering, 1892; Assistant in Physics, Wor. Polytechnic Institute.

ADMINISTRATION.

The Trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through the three committees named below, and also through the President of the University.

BOARD OF TRUSTEES.

JONAS G. CLARK,

STEPHEN SALISBURY,	JOHN D. WASHBURN,
GEORGE F. HOAR,	FRANK P. GOULDING,
WILLIAM W. RICE,	GEORGE SWAN,
EDWARD COWLES,	THOMAS H. GAGE.

OFFICERS.

President, - -	JONAS G. CLARK.
Vice-Presidents, -	GEORGE F. HOAR, WILLIAM W. RICE.
Treasurer, - -	THOMAS H. GAGE.
Secretary, - -	FRANK P. GOULDING.

COMMITTEES.

Finance.

JONAS G. CLARK, STEPHEN SALISBURY,
JOHN D. WASHBURN, THOMAS H. GAGE.

Buildings.

JONAS G. CLARK, JOHN D. WASHBURN.

By-Laws.

JONAS G. CLARK.

WILLIAM W. RICE, STEPHEN SALISBURY,
JOHN D. WASHBURN, GEORGE SWAN.

PRESIDENT.

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees, shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent, or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the corporation, September 26, 1889.

FACULTY.

By action of the Trustees the Faculty Staff has been organized as follows:

I. UNIVERSITY SENATE.

Whose duty it is to elect Fellows and to take action upon general requirements for the Doctor's degree and other promotions, and to act and advise upon matters officially submitted to them.

II. General Faculty.

Whose duty it is to consider all matters not otherwise provided for, and in which all departments of the University are alike interested.

III. The Library Committee.

To be appointed by the President or Trustees, the duty of which shall be to advise concerning the arrangement, cataloguing and use of books and other matters pertaining to the library not reserved to the Trustees or otherwise provided for.

GENERAL STATEMENTS.

The University now consists of a group of five closely related departments, in which all its work and that of instructors, fellows, and scholars is grouped. These departments are as follows :

I. Mathematics.
II. Physics.
III. Chemistry.
IV. Biology.
V. Psychology.

In addition to these *Education* is now a sub-department.

Admission.

Only graduate students are admitted, or those of equivalent attainments, unless in rare and special cases. At present no entrance examinations are required, but, by testimonials, diplomas, personal interviews or written specimens of work, the authorities must be satisfied that the applicant has scholarship enough to work to advantage, and zeal and ability enough to devote himself to his chosen

field. The methods of the University are too costly, and its energy and funds too precious to be spent upon men who are not well trained, promising, and in earnest.

It is highly desirable, and will probably before long be required, that candidates entering any of the five departments shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges, and to supply every incentive possible in the way of books, facilities, and above all, direct personal stimulus and instruction. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction.

Classes of Appointees.

No clearly marked line exists between students and instructors. Fellows and scholars who have attained some degree of mastery in a special line of work give brief special courses, which are often attended by professors. This is a stimulus to the student, and both tests and exhibits his power in teaching. This and the custom of instructors to

attend each other's lectures, add interest and efficiency to the work of the University.

I. Docents.

The highest annual appointment is that of Docent. These positions are primarily honors, and are reserved for a few men whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. They are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qualify them still more fully for academic advancement.

These positions are now official appointments. Appointees, or others found worthy, however, may be formally invested with the *licentia docendi*, the terms of which can now be furnished on application and which requires a memoir or essay representing original work in their own department, but no examination. This highest formal academic honor will be strictly reserved for those of marked

scientific attainment and teaching ability, and so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that by the existence of such a select body of men of guaranteed scientific training, ability and approved power to teach, the difficulties under which college trustees sometimes succumb in selecting suitable men for their professors may be diminished, and that otherwise this new grade will aid in raising standards of academic scholarship in colleges and in encouraging scientific research here. Good men of this class may be paid a salary.

II. Candidates for the Degree of Doctor of Philosophy.

In most cases it is probable that three, or at least two, years of graduate work will be necessary for this degree. Examinations for it, however, may be taken at any time when, in the judgment of the University authorities, the candidate is prepared. A pre-arranged period of serious work at the University itself is indispensable.

For this degree the first requirement is a thesis upon an approved subject to which it must be an

original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor, printed at the expense of the candidate, and at least one hundred copies given to the University. In case, however, of theses of very unusual length, or containing plates of unusual expensiveness, the academic Senate shall have power, at the request of the candidate, to reduce this number of presentation copies to 50. Each of these copies shall bear upon it in print, the statement of the chief instructor, that it is a thesis for the Doctor's degree in his department at Clark University.

Such formal or informal tests as the academic Senate shall determine shall mark the acceptance of each student or fellow as a candidate for this degree.

One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede by not less than three months and not more than one year the examination itself, and the nature and result of this test shall be made matter of record.

The fee for the Doctor's degree is $25, and in every case it must be paid and the presentation

copies of the thesis must be in the hands of the Librarian before the diploma is given. In exceptional cases, however, and by special action of the Senate, the ceremony of promotion may precede the presentation of the printed copies of the thesis. The latter, however, must always precede the actual presentation of the diploma.

An oral but not a written examination is required upon at least one minor subject in addition to the major, before an examination jury, composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Senate, who, if they are also satisfied, may recommend the candidate for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained. They desire that the standard requirements for it be kept the highest practicable, that it be reserved for men of superior ability and attainment only, and that its value here be never suffered to depreciate.

It is to the needs of these students that the lectures, seminaries, laboratories, collections of books,

apparatus, etc., are specially shaped and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

III. Special Students not Candidates for a Degree.

Any one desiring to undertake a special and approved line of research and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes those who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, psychology, or education—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

IV. Preliminary Candidates.

Non-university students of less special, or less advanced standing than the above three classes, who are nearly, if not quite, qualified to become candidates for the degree of Doctor of Philosophy, may also be received.

Students of this class must for the present have completed the work of the first three years of a regular under-graduate course in a college of good standing, or the equivalent thereof. They must satisfy the authorities of the University of their attainments, and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may in exceptional cases be elected to Scholarships.

The Clark Fellowships and Scholarships.

10 Fellowships of $600 per year.
10 Fellowships of $400 per year.
10 Scholarships of $200 per year.

In general these appointments may perhaps represent the successive stages of approximation to the Doctor's degree, the highest priced Fellowships be-

ing for men within a year of that degree, the next for those within two years of it. Those who have already taken the Doctor's degree or those not intending to do so, may be appointed to fellowships and Scholarships. *The tuition fee, which is included in the above sums, will be deducted.*

The founder of the University and his wife unite with the Trustees and President in inviting sympathy and practical co-operation in the multiplication of such aids, large or small, temporary or permanent, here at the outset.

A Citizen's Fund.

In addition to this a citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

The Field Fund.

Mrs. Eliza W. Field has also given $500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

Purpose and Conditions of Fellowships and Scholarships.

Fellowships at Clark University are intended for young men of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

Applications should state the candidate's course of study and be accompanied by testimonials or diplomas, should indicate a decided preference for some special department, and if possible be accompanied by some specimen of his work for the aid of the Board of Selection. Applications will be considered in June and in October, and should be in the hands of the President on or before the first of these months. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year and devote themselves to special studies under the direction of their instructors and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order and all the ends of the University, must not teach elsewhere and may be reappointed at the end of the year. Because intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

Both Scholarships and Fellowships are open only to students in one or more of the five departments announced.

METHODS.

Besides field work, excursions to institutions public and private, coaching and cram-classes, clubs, examnations, conferences and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

Lectures. The Trustees desire that each instructor of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus and references to standard text-books, and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will from time to time be given.

Seminaries. These are stated, perhaps weekly, meetings for joint, systematic work, under the personal direction of the professor, in some special part of his subject. Here the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded, and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this was from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, methods discussed and perfected, with a view to developing that independence in re-

search which is the consummation of scientific culture.

NOTICES.

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $200 per annum; but special arrangements may be made with individuals who are not under appointment as Scholars or Fellows.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will, so far as possible, be informed upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, L. N. Wilson, Worcester, Mass.

DEPARTMENTS.

The statements of the instructors concerning the courses to be given during the academic year 1893–94, which follow, are supplemented by a fuller account of the past and present work of each department contained in the third Report of the President and Departments, April, 1893.

Further announcements may be made later.

I.

MATHEMATICS.

Programme for 1893-94.

Beginning with the academic year 1893-94, the introductory courses will be given in alternate annual groups, as follows:

Group A (to be given in alternate years, beginning with 1894-95).

Analytic Geometry of Conic Sections, Quadric Surfaces and Higher Plane Curves; 3 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables and Definite Integrals; 3 hours a week, through the year.

Theory of Numbers; 2 hours a week, first half-year.

Modern Synthetic Geometry; 2 hours a week, second half-year.

Group B (to be given in alternate years, beginning with 1893-94).

Analytic Geometry of Conic Sections, Quadric Surfaces and Higher Plane Curves; 3 hours a week, through the year.

Elliptic Functions, Differential Equations and Calculus of Variations; 3 hours a week, through the year.

Algebraic Substitutions and Their Applications to the Theory of Equations; 2 hours a week, first half-year.

ANALYTIC GEOMETRY OF HIGHER SURFACES AND TWISTED CURVES; 2 hours a week, second half-year.

ALGEBRAIC INVARIANTS; 2 hours a week, first half-year.

It will be observed that the first course in each group is the same; that course alone is repeated annually, while the other courses are given but once in two years. It is expected that every student will take each course (unless he has already completed an equivalent course elsewhere) in the earliest year of his residence in which it is given. These courses are briefly described in the Third Report of the President and Departments (April, 1893). Their chief object is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, the conic sections and quadric surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times; the usual college courses in these subjects furnish the necessary preparation for the courses here given.

A *Seminary* will be conducted in connection with each group, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics considered will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

For 1893-94, advanced courses are offered as follows:

BY PROFESSOR STORY:

TWISTED CURVES AND TORSES; 2 hours a week, first half-year.

HYPERSPACE AND NONEUCLIDEAN GEOMETRY; 2 hours a week, second half-year.

ENUMERATIVE GEOMETRY; 2 hours a week, first half-year.

BY ASSISTANT PROFESSOR TABER:

QUATERNIONS; 2 hours a week, first half-year.

FINITE DIFFERENCES AND PROBABILITIES; 2 hours a week, second half-year.

BY M. DE PEROTT:

THEORY OF NUMBERS; 2 hours a week, second half-year.

Each advanced student will be placed under the supervision of one of the instructors for guidance in original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

If it is desired, Dr. Taber may give a course of lectures on the Elements of the Infinitesimal Calculus, the Theory of Probability, and the Method of Least Squares, with applications to statistics. These lectures are designed for students of the non-mathematical courses; the aim will be to give such students a working knowledge of the subjects sufficient to enable them to deal intelligently with the problems that arise in the ordinary course of experimentation. The course may be extended to include the theory of induction and its relations to the theory of probability.

For further details concerning the department (members and courses of instruction for the last four years; general policy of the department; library facilities and apparatus), see the *Third Report of the President and Departments*, pp. 17-63.

II.

PHYSICS.

Instruction in this department will be given by ARTHUR G. WEBSTER, Ph. D., Assistant Professor of Physics.

The aim of the department is to ensure in the students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research, he will at all times have the benefit of the direction and advice of the instructor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact reasoning is possible, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches, and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance, may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat, the steady flow of electricity, certain cases in hydrodynamics and sound, or in the theory of magnetic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "spin," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathe-

matical expression of the energy involved. Physics may be defined as the Science of Energy, and it is attempted, so far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

The following courses of lectures will be given, repeated at least as often as once in three years, the time that will ordinarily be required for the attainment of the doctor's degree.

(*a*) Dynamics, General Methods, Systems of Particles, Rigid Bodies.

(*b*) Elasticity, Hydrodynamics, Vibratory Motions, Sound, Light.

(*c*) Optics, Physical and Geometrical.

(*d*) Potential, Electricity and Magnetism.

(*e*) Flow of Heat and Electricity, Thermodynamics, Kinetic Theory of Gases, Capillarity.

(*f*) The Partial Differential Equations of Mathematical Physics and the Arbitrary Functions Arising in Connection with them.

The courses for the year 1893-94 will be (*c*), (*e*), and probably (*f*).

In addition to the above courses, there has this year been established a Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation of summaries of important articles appearing in the journals, thus furnishing an important means of keeping in touch not only with what has been done, but with what is being done in the various parts of the world in the domain of physics. These meetings have been frequently attended by members of other departments.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be commended for study not merely those portions of the Calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants.

A fuller account of the above courses of lectures, as well as a description of the facilities of the department, and a statement of the requisitions for the doctor's degree, may be found in the *Report of the President and Departments* for 1893.

III.

CHEMISTRY.

The Department of Chemistry offers to the student who is fully prepared to begin graduate work, a series of regularly recurring laboratory and lecture courses, so combined with special advanced courses of a less permanent character that all graduate subjects required in the examination for the doctor's degree will be presented within the space of two years. The laboratory courses and lectures on Organic and some branch of Theoretical Chemistry will be given each year. The special courses, which will include such subjects as Analytical, Inorganic and Physiological Chemistry, Crystallography, and "Special Topics," will be different on different years and cannot always be announced long in advance.

LECTURE COURSES FOR 1893-94.

I. (a) ORGANIC CHEMISTRY.—Methods of organic analysis and molecular-weight determination, physical properties of organic compounds, the chemistry of the fatty series in detail, the polymethylenes, the thiophene group and the simpler derivatives of benzene. Two lectures a week for one-half year, 1893-94.

(b) ORGANIC CHEMISTRY (advanced course).—The chemistry of complex aromatic rings, including the quinoline and

pyridine groups. This is a continuation of last year's lecture course on organic chemistry and also supplements, I. (a). Two lectures a week for one-half year, 1893-94.

Courses I. (a) and I. (b) will be combined to form a single course of two hours a week during the year 1894-95.

II. History of Chemistry Since Lavoisier.—One prominent feature of this course will be a careful study of the evolution of the theories in regard to chemical constitution of compounds since the formation of Dalton's atomic hypothesis. The library facilities are such that it will be generally possible in the seminary work to illustrate the condition of chemical theory at different periods by a study of original memoirs. Lectures or seminary work once a week during the year 1893-94.

III. Physical Chemistry.—A course of lectures on this subject will, if possible, be offered at least every other year.

IV. Selected Topics in Advanced Chemistry.—Once a week during the year 1894-95.

V. Journal meetings for reporting and informally discussing important work appearing in the current chemical literature will be held once a week throughout each year.

LABORATORY COURSES.

Although as a rule only such men will be admitted to this department as have already completed a good college course in Chemistry, and are practically acquainted with the ordinary analytical methods, since the majority of our colleges do not yet give sufficient training in the methods employed in making organic preparations and analyses to render it possible for their graduates to begin upon research work immediately, the following introductory laboratory courses (VI.),—which are also suitable for minor subjects,—have been instituted, and are offered yearly :—

VI. (a) General Experimental Inorganic Chemistry.

(b) Analytical Chemistry.—Qualitative and quantitative.

(c) Molecular-weight Determinations.

(d) Organic Preparations.

VII. Chemical Research.—As soon as a student has obtained the necessary preliminary training in the subjects represented in course VI., he may at once begin upon some scientific research under the direction of an instructor. The subject chosen for investigation may originate with the student, or may be proposed by an instructor; but must be one that meets the approval of the head of the department. When sufficient material for a satisfactory dissertation has been collected and the other requirements have been fulfilled, the candidate for the degree of Ph. D. may present himself for examination. The time required for this course varies much with different students, but is usually about two years, when 30–40 hours are spent in the laboratory each week.

The laboratory and library are open at all hours during the day, and afford every facility for advanced work. An account of the past work and present facilities of the Chemical Department may be found in the "Report of the President and Departments of Clark University," for 1893, pp. 79–90.

IV.

BIOLOGY.

Programme of Work for Year 1893–94.

Dr. Hodge will offer the following courses :

I. General Biology.—It is intended in this course to outline the principles of biological science. The most general classification of plants and animals will be given with description of structural and physiological characteristics in a series of typical organisms. The topics, organization, growth and reproduction, specialization and evolution will be given special prominence throughout the course. One lecture weekly, October to January. Laboratory work, six hours weekly, to be arranged to meet the requirements of those taking the course.

II. Comparative Study of Nervous Systems and Sense Organs.—The point of view in this course will be both anatomical and physiological. It will begin with a study, as far as possible comparative, of the structural elements of the nervous system in both invertebrates and vertebrates. Following this it is proposed to consider the structure and functions of the nervous system in a series of animals, beginning with the cœlenterata and ascending through the mollusca, vermes, tunicata, arthropoda, and vertebrates. The course will be fully illustrated by diagrams, models, dissections, and experiments. It is also intended to so arrange portions of courses I. and II. as to fill out on the biological side the course

in comparative psychology and psychogenesis to be given by Dr. Sanford. One lecture weekly throughout the year.

PHYSIOLOGY AND NEUROLOGY.

The courses in physiology are arranged in such a manner that the general field may be covered in two years. This scheme will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution of original research.

The general subject will include lectures, reading courses, seminaries, demonstrations, and laboratory work in the following lines:

1. Muscle and nerve.
2. Circulation, respiration, digestion, nutrition and excretion.
3. Brain.
4. Skin and sense organs.
5. Reproduction.

During the work in each of the above divisions, the microscopical structure of the organs concerned as well as the physiological chemistry connected with their action, will receive especial attention.

During the year 1893–94 a course supplementing course II., or it may be taken independent of it, will be offered in :—

III. Muscle and Nerve Physiology.—This course will include reflex action. It will extend from January to May, with lectures, demonstrations, and laboratory work arranged to meet the requirements of students taking the course.

By way of supplementing the above courses and courses in other departments of the University, a number of special courses have been planned as follows:

IV. Embryology of the Human Brain and Sense Organs.—Six lectures, with demonstrations and literature. special prominence will be given to the growth of the brain in children in connection with the course in Motor Education to be given by Dr. Burnham.

V. History and Present Status of Cerebral Localization.—Six lectures with specimens for demonstration and repetition of classical experiments. It is intended to give this course toward close of year, after course III. has been completed.

VI. Practical Histology of the Nervous System.—The course will be purely a laboratory course, with such lectures, directions and conferences as may be required by those taking it. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course II. or devote their time to special problems.

Experimental Work.

Laboratory work in physiology and neurology will be arranged to suit the needs and purposes of members of the department. As soon as practicable each student will be expected to undertake an original research. It is to be hoped that men coming to the laboratory to study will have problems in which they are already interested. In case, however, they have not, work will be assigned. A considerable amount of valuable material has already accumulated in the laboratory, and is waiting to be worked up. A course in Biology, such as is now given in the undergraduate department of our colleges and state

universities, will fit students to begin the laboratory work here.

Laboratory facilities and equipments are of the best. Library advantages are also good. For fuller information on these points the reader is referred to the *Report of the President* for 1893, which will be furnished upon application.

In connection with the above courses it is intended to hold weekly, if possible, journal club meetings for the purpose of reporting and discussing important articles in the current periodicals.

V.

PSYCHOLOGY.

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and physiology of the brain and spinal cord; senses; and other parts of the body, especially the muscles; the organs of the will, so far as they affect psychological powers and processes. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and experimental psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-Times, Memory and Attention. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Abnormal and morbid psychology, as nature's experiments, *e. g.*, border-line phenomena as seen in neurotic people, prodigies and geniuses; Defectives, such as the blind, deef, criminal, idiotic; Mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's clinic and lectures below.

IV. Anthropological psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Prim-

itive Art, and the study of the life of savages and children; Adolescence and senescence; physical measurements illustrating laws of growth in size and power, &c. See Dr. Chamberlain's laboratory and courses.

V. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality. Mr. Gilman has represented the first part of this work during the present year.

VI. History of psychology and philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's course.

VII. Applications of psychology; pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sexual problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do in two or three years.

For a full statement of what has been done in this department from the opening of the University down to the present, see the *Report of the President and Departments*, April, 1893.

During the academic year 1893–94, the following courses will be given :

Dr. G. Stanley Hall's Courses.

A. History of Psychology and Philosophy from the beginning of the scholastic period to the present. This course is a continuation of the course on Ancient Psychology and Philosophy given during the present year. It will include medical, scientific and educational theories, and a discussion of contemporary writers. The efficient coöperation of Mr. S. S. Green, librarian of the Public Library, has been very helpful to

this course during the present year and is assured for the future. Four times weekly throughout the year.

B. Abnormal Psychology.—This will be a general presentation of the entire field, with special emphasis upon such points as are of value for special students of psychology. One hour a week throughout the year.

C. The Psychology and Philosophy of Education.—This course will present the general field with as much completeness and connection, and with such historical matter and practical application, as the lecturer is able. One hour a week throughout the year.

D. Conferences will be held in the President's library Monday evenings, as during the present year, for reading, discussion, etc. One three hour session weekly.

E. Saturday Afternoon Clinics will be held at the Hospital for the Insane, or during the latter part of the present year. Visits to other institutions, educational, penal, etc., in Worcester and Boston, will also be made weekly during a part of the year.

F. Students' Lecture Courses.—Students are expected to give one or more lectures, open to members of the University, upon topics to which they have given chief attention during the year. These courses have been both valuable and attractive.

Dr. E. C. Sanford's Courses.

G. A General Course of Lectures and Demonstrations.—The aim of this course will be to present in a concise form the present aspect of the psychological field in general. The senses, psycho-physic law, reaction-times, association, memory, attention, volition, illusions, sleep, dreams, space, time, and feeling, will be treated, not however, as separate topics, but in their proper perspective and from the standpoint of psychological science. This course will be illustrated as fully as possible with charts and apparatus. One hour weekly throughout the year.

H. A PRACTICUM in connection with course G will be conducted by a competent demonstrator (to be appointed). The apparatus and the methods referred to in the lectures will be explained to the students, and they will be personally instructed in handling them. Weekly for the first half year. Courses G and H are intended for all those generally interested in psychology, and in particular for those taking psychology as a minor subject, or as subsidiary to pedagogy, or the history of philosophy.

I. AN ADVANCED COURSE, intended for those whose major interest is in psychology. This will consist of a number of short courses upon special topics, as follows: Comparative Psychology and Psychogenesis, parallel to the course of Dr. Hodge on Comparative Neurology; Relations of Psychical Action to Circulation and Respiration; Psychology of Laughter and Humor; A Psychological Laboratory and its Equipment. In addition to these, courses may be given on Personal Equation and Errors of Observation (in which members of other departments may be interested), and on Leading Psychologists of this Century. One hour a week throughout the year.

FIRST YEAR'S LABORATORY WORK.

J. The laboratory will be open only to those whose chief interest is in psychology. The work at first will be calculated to introduce the student to the most important instruments and methods. As soon as expedient, however, the student will be encouraged to undertake original work in coöperation with the instructor. It is believed that by a system of scientific apprenticeship, the student may safely do this at an early stage of his course, and that the intimate contact of instructor and student will reach the very best pedagogical results.

K. SEMINARY AND JOURNAL CLUB.—A seminary or journal club, or both, may be organized during the year.

DRS. HALL AND SANFORD.

L. ADVANCED LABORATORY WORK.—This work is in all cases undertaken under the personal guidance of the instruct-

ors, the aim being to suggest to each man that problem that will be best adapted to his special needs and abilities. The laboratory will be open for this advanced work of research at such times as are convenient to those engaged in it.

Dr. Chamberlain's Courses.

M. General, embracing: (a) History, scope and relations of the science of Anthropology. (b) Physical Anthropology. Problems, investigations, results, laboratory work. (c) Ethnography. Races and race-origins. (d) Ethnology, including sociology; origin and development of the arts and sciences; mythology; folk-lore; religions. (e) Linguistics. Race and language. Origin and development of language and of languages. Psychology of language. Gesture-speech and written language. Comparative linguistics. Comparative literature. (f) Criminal and Pathological Anthropology. Ethnic morals. (g) Historical and Archæological. Primitive man and primitive culture. One hour a week throughout the year.

N. A Special Course on: The Folk-lore and Mythology of Ancient Greece and Rome in the Light of Modern Comparative Research.

O. A Special Course on: Life and Education of Children amongst Primitive Races, especially the American Indians.

The lectures in anthropology will have special bearing upon the courses in psychology and pedagogy in the University, as may be seen from the outline given above.

From time to time reviews of the most important current literature will be made and students acquainted with the best contributions to anthropological science in the various foreign languages.

For details concerning all the work in the Department of Psychology from the opening of the University to the present time, including laboratory equipment, library facilities, publications, including the *American Journal of Psychology*, edited in the department, etc., see the *First Triennial Report of the President and Departments*, April, 1893.

VI.

EDUCATION.

This has been made a sub-department and now offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with the work in psychology and anthropology, and in part based on these. The work in this department is intended to meet the needs of the following classes of men:

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional, and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Educational Department includes courses upon the following subjects:

I. (a) Child Study. (b) Educational Psychology. (c) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus, etc.

III. (a) Organization of Schools in Different Countries. (b) Typical Schools and Special Foundations. (c) Motor Education, including manual training, physical education, etc. (d) Moral Education. (e) Ideals.

IV. Higher Education, including university work, technical education; training in law, medicine, and theology; recent progress, present state and prospects of the most advanced education in different countries, including our own.

The courses in education for 1893–94 will be as follows :

Dr. G. Stanley Hall's Courses.

(A) Present Status and Problems of Higher Education in this Country and Europe. One hour weekly, half a year.

(B) Outline of Systematic Pedagogy. One hour weekly, half a year.

Dr. Burnham's Courses.

(C) Organization of Schools in Europe, especially the schools of France, Germany, Sweden and England. Typical schools will be described and educational principles illustrated by them will be expounded and discussed. References will be made to important literature, and the work may serve as an outline for further study. One hour a week, half a year.

(D) School Hygiene, following and supplementing his "Outlines of School Hygiene," and considering special topics. One hour a week, half a year.

(E) Educational Reforms, involving the discussion of a few fundamental educational principles and the presentation of chapters in the history of education. One hour a week, half a year.

(F) Motor Education of Children. This course will endeavor to elucidate the principles that should govern this side

of education, and will involve the study of writing, drawing, manual training, and of play and gymnastics as means of motor education. The course may include also the study of motor training and muscular development in relation to intellectual ability and moral character. One hour a week, half a year.

(G) The work of the *Seminary*, once a week throughout the year, will be, for the most part, adapted to individual students. It is hoped that each student will select, after conference with President Hall and Dr. Burnham, a topic for special investigation. The results of such study may be published.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department is especially rich in foreign educational literature, and considerable illustrative apparatus has been collected. The Worcester Public Library and the library of the American Antiquarian Society are also accessible to students.

The *Pedagogical Seminary* is published by this department and offers facilities for printing digests, reviews and more valuable papers prepared by the members of the department.

For a fuller account of the facilities and history of this department, see the *Report of the President and Departments*, 1893.

LIBRARY.

The University Library now contains 15,500 bound volumes and 1,500 pamphlets, and the reading room receives 239 journals. With the exception of 3,200 Congressional publications and other contributed volumes, the library and the journals represent chiefly the five departments.

The books are grouped as follows :

A Works of General Reference.
B Journals.
C Mathematics.
D Physics.
E Chemistry.
F Zoölogy.
G Physiology.
H Pathology.
I Psychology.
J Philosophy.
K Ethics.
L Criminology.
M Anthropology.
N Education.
O Botany.

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their room, case, tier and shelf. They comprise in addition to Congressional publications, bound files of magazines, several score of rare old books, a collection of art publications, travels, complete works, sets of reports, histories, biographies, etc.

The library of the University at present consists of six rooms. I. The large general room, containing A,

B, C, D, F, G, H, I, J, K, L, M, and O. II. The journal room. This contains chiefly current numbers of journals and books of reference. The journals are arranged on broad shelves on each side of the room for ready inspection. III. The educational room. This contains all the educational works except state and city reports and college publications, which have a place and a catalogue by themselves. IV. Chemical Library room, containing both the books and periodicals in that department and labeled E. V. A small store room for books not yet placed on the shelves or catalogued. VI. A small room for duplicates, unbound copies of journals, etc. Besides the subject classification, books are arranged in cases, tiers, shelves, etc.

All the privileges of the library are open to all appointees of the University alike.

The library is open from 8 A. M. to 6 P. M., and each member of the University has direct access to every book and journal.

Outside the University are found:

The Library of the Antiquarian Society, organized in 1812, containing 90,000 volumes, and which is accessible to all members of the University.

The Worcester Public Library, containing about 360 periodicals and 86,000 volumes, has supplemented the scientific publications purchased by the University and all the privileges are accessible without charge.

A Medical Library of 8,000 volumes is also accessible.

By the courtesy of the Librarian of Harvard University and of the Surgeon General at Washington, books from both these instituions are sent to the University

for a limited time, and by the courtesy of S. S. Green of the Worcester Public Library, all the resources of that institution and its facilities for borrowing from distant libraries are available to all members of the University.

LIBRARY RULES.

1. No loud talk is allowed in any part of the library or reading room.
2. Every book shall be returned at the end of three weeks from the time at which it was taken out; at this time it may be renewed for three weeks, unless wanted.
3. Any book may be called in at three days' notice at the discretion of the Secretary of the Library Committee.
4. Any member of the staff may reserve from circulation such books as he deems necessary in connection with the courses given in his department; and these shall be placed by themselves and marked "reserved."
5. Current numbers of periodicals shall not be taken out until they have been in the library two weeks.
6. Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P.M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out on Saturdays at 12 M. and may be kept until 9 o'clock the next Monday morning.
7. All dictionaries, cyclopædias, and books of general reference, are permanently reserved.
8. Books of great value may be taken out only by special permission.

BY-LAWS.

The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

As the efficiency of the University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered

appointments, to maintain harmony within the Faculty and to increase their efficiency in research and instruction, shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

The President of the University shall be the medium of communication between the Trustees and instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

The President shall call and preside over all official meetings of the instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University, and not engaged in the work of instruction; the duties of all such persons shall be assigned, and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

No instructor shall order any books or apparatus, or anything connected with the work of instruction, without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same, shall be made without the approval of the Board of Trustees or Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any persons shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

Each instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept, and if possible, by example.

The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee or the President.

These By-Laws, or any one of them, may be changed, amended or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified and held for that purpose.

REGULATIONS.

1. All requisitions for apparatus and books must be made through the University office upon printed blanks provided for that purpose, and, except in the case of docents, signed by a member of the staff.

2. So far as possible orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that of teaching and illustration only.

3. A book shall be kept for each department containing a complete list of apparatus and supplies with itemized cost. With the aid of this book a complete inventory of the stock shall be made once a year and whenever else the President shall direct.

4. Requisitions for repairs, furniture, plumbing and work about the buildings must be made in writing and with detail, and must be approved by the Building or Finance Committee, or such person or persons as they may authorize. When once thus passed upon no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

5. No unappropriated rooms, and no part of the University grounds, shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

6. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at

the office, and for longer absence permission should be obtained beforehand.

7. The Trustees desire that no instructor, docent or fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

The following additional rules were passed by the Board of Trustees at a meeting held April 4th, 1891, to take effect for the next academic year :

8. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstation or illustration ; all metal and carpenter work connected with the scientific activity of each department, and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

9. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

10. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the University office.

PUBLICATIONS CONNECTED WITH THE UNIVERSITY.

I.—The American Journal of Psychology.

This *Journal* was commenced in November, 1887, and is edited by Dr. G. Stanley Hall. Each volume contains four numbers of about 150 pages each. Besides original articles, about half its space is devoted to careful digests of the important literature in its field. Price, $5.00 per volume; single numbers, $1.50. J. H. Orpha, publisher, Worcester, Mass.

II. The First Official Announcement was issued May 23rd, 1889.

III. The Addresses and Exercises at the opening of the University on October 2nd, 1889.

IV. Register and Second Official Announcement, May, 1890.

V. First Annual Report of the President to the Board of Trustees, October 4, 1890. This contains the first statement of the plan, aims and methods of the University, and reports upon the original investigation of each department from each member who has made such.

VI. Register and Third Official Announcement, April, 1891.

VII. Second Annual Report of the President to the Board of Trustees, September 29, 1891.

VIII. Register and Fourth Official Announcement, April, 1892.

IX. Third Annual Report of the President to the Board of Trustees, April, 1893. Contains a full report of the work done in each department since the opening of the University, pp. 168.

X. The Pedagogical Seminary.

This journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. Each volume contains from 400 to 500 pages. It is the organ of the Educational Department of the University. Price, $4.00 per volume. Single numbers, $1.50. J. H. Orpha, publisher, Worcester, Mass.

SUMMER SCHOOL OF PEDAGOGY AND PSYCHOLOGY.

A summer school in pedagogy and psychology was held at the University during the last two weeks in July. It was conducted by Drs. Hall, Sanford and Burnham. Three sessions a day were held and the resources of the library and laboratories in this department were placed at the disposal of the members. The exercises consisted of lectures, demonstrations, seminaries, etc., and a fee of $20 for the two weeks was charged. The topics treated were, for the most part, selected beforehand by intending members of the school from an extensive list comprising the regular courses of the University in psychology and pedagogy.

MEMBERS OF THE SUMMER SCHOOL.

CHARLES F. ADAMS, Instructor in Massachusetts State Normal School, Worcester, Mass.

E. G. ADAMS, A. B., Supt. of Schools, Rochester, Minn.

HERBERT E. AUSTIN, Teacher of Science and Mathematics, Dalzell's School, Worcester, Mass.

THOMAS P. BAILEY, JR., Ph. D., Adj., Prof. of Biology, South Carolina College, Columbia, S. C.

JOSEPH BALDWIN, Ph. D., Prof., School of Pedagogy, University of Texas, Austin, Tex. "The Art of School Manage-

ment," "Elementary Psychology," "Psychology Applied to the Art of Teaching."

EARL BARNES, M. S., Prof. of Education, Leland Stanford, Jr., University, Palo Alto, Cal.

WILLIAM P. BEECHING, Assistant in Science, Cook County Normal School, Englewood, Chicago, Ill.

MISS ELLEN BLAKE, 50 West street, Worcester, Mass.

MISS LOUISA BLAKE, 50 West street, Worcester, Mass.

EDWARD F. BUCHNER, A. M., Lecturer on Pedagogy, Yale University, New Haven, Conn.

MISS S. L. BURLINGAME, M. A., Preceptress, in Central Baptist College, Conway, Arkansas.

MISS ANNA M. BURNHAM, Vice-Prin. Harrison School, Portland, Oregon.

MISS ISOBEL CAMP, Pd. M., Teacher Brooklyn Public School No. 5, 62 Willow street, Brooklyn.

MISS E. E. CARLISLE, Director of Teachers' Training School, Norwich, Conn.

ELIAS COMPTON, Ph. D., Prof. Psychology and Philosophy, University of Wooster, Ohio; Editor *Post Graduate and Wooster Quarterly.*

EMILY I. CONANT, Ph. D., Teacher of Psychology, Lloyd Normal College, New York City, 42 West street, New York.

CHARLES HENRY DOUGLAS, A. M., Head Master Keene High School and City Supt., Keene, N. H.

MISS HARRIET F. EASTABROOKS, Prin. Primary Training Department, State Normal School, Mankato, Minn.

F. H. EATON, A. M., late Teacher of Mathematics in the Nova Scotia Normal School, 40 Concord avenue, Cambridge, Mass. "Treatise on Trigonometry and Its Application."

GEORGE L. FARNHAM, A. M., Prin. State Normal Schools, Peru, Neb. "The Sentence Method."

MISS GERTRUDE FLYNN, Training and Method Teacher, State Normal School, Norwich, Conn.

MISS LILA N. FROST, Prin. Bromfield School, Harvard, Mass.

MISS ELLEN M. HASKELL, State Normal School, Worcester, Mass.

Miss Emily A. Hayward, M. A., High School Teacher of English and Latin, Denver, Colorado.

Walter L. Hervey, A. M., Pres. College for the Training of Teachers, New York City.

Harriet E. Hunt, Ph. D., Prin. of School and Director of Nature Studies, Public Schools, Brookline, Mass.

Joseph Jackson, Prin. Woodland Street School, Worcester, Mass.

James Jenkins, A. M., Prin. English High School, Worcester, Mass.

Miss Rebecca Jones, Teacher of Methods in State Normal School, Worcester, Mass.

E. Oram Lyte, Ph. D., Prin. Pennsylvania State Normal School, Millersville, Pa. Grammar and Composition, Practical Book-keeping, School Song Book, School Bell, etc.

E. Mackey, A. B., Supt. of Schools, Butler, Pa.

Miss Sarah Marble, Teacher in Rhode Island State Normal School, Providence, R. I., Woonsocket, R. I.

C. A. McMurry, Ph. D., Supt. of Practical Work, State Normal School, Normal, Ill. "General Method," "Pioneer History Stories," "A Geography Plan."

F. M. McMurry, Ph. D., Student of Education, Paris, France.

Miss Jennie B. Merrill, Ph. D., Instructor of Pedagogy, Normal College, New York City.

Theodore B. Noss, Ph. D., Prin. State Normal School, California, Pa. "Outlines of Pedagogy and Psychology."

F. W. Osborn, A. M., "Famous American Political Documents;" Prof. of Mental, Moral and Political Science, Adelphi Academy, Brooklyn.

Alvin F. Pease, A. M., Supt. of Schools, Northampton, Mass.

Miss Alice Edwards Pratt, Ph. B., Asst. Prin. Santa Rosa Seminary, Santa Rosa, Cal.

Miss Lucy A. Pratt, A. B., 778 Main street, Worcester, Mass.

E. B. Prettyman, A. M., Prin. of Maryland State Normal School and *ex-officio* State Supt. of Public Instruction, Baltimore, Md., 1,200 Lafayette avenue.

JOHN T. PRINCE, Ph. D., Agent Massachusetts Board of Education, Boston, Mass. "Courses of Studies and Methods of Teaching," "Organization and Instruction in the Schools of Germany."

MISS REBECCA S. RICE, A. M., Prin. of Girls' Collegiate School, Chicago, Ill., 481 Dearborn avenue.

E. HARLOW RUSSELL, Prin. State Normal School, Worcester, Mass.

LEE RUSSELL, B. S., Teacher of Manual Training, Halifax, Nova Scotia, 11 Inglis street, Halifax.

MISS E. C. SABIN, Pres. Downer College, Fox Lake, Wis., late Supt. of Portland, Ore., City Schools.

HOWARD SANDISON, M. A., Prof. of Psychology and Methods, Indiana State Normal School, Terre Haute, Ind. "The Theory of the School," "Educational Psychology."

NATHAN C. SHAEFFER, Ph. D., Prin. Keystone State Normal School, Kutztown, Pa.

LEVI SEELEY, Ph. D., Prin. Ferry Hall Seminary and Prof. of Education, Lake Forest University, Lake Forest, Ill. "The Grube Method," "The Grube Idea."

EDWARD R. SHAW, Ph. D., Prof. of the Theory and Art of Teaching, University of the City of New York, New York City.

W. J. SLATTERY, A. B., Teacher of Psychology and Methods, City Training School, Paterson, N. J.

MISS MARGARET K. SMITH, Teacher of Psychology and Method, Oswego Normal School, Oswego, N. Y.; joint author of "Development Lessons," translator of Seidel's Industrial Instruction, Herbert's Manual of Psychology.

JOHN D. STAY, A. M., Supt. Public Schools, Yankton, South Dakota.

MISS ROSE C. SWART, Inspector of Practice Teaching, State Normal School, Oshkosh, Wis.

F. TRACY, B. A., Fellow in Toronto University, Toronto, Canada.

MISS NATHALIE L. VIDAUD, Teacher in Yonkers High School, Yonkers, N. Y.

W. J. WAGGENER, A. M., Prof. Natural Philosophy, University of Colorado, Col.

MISS ANNA M. WAITE, Salisbury Street School, Worcester, Mass.

MISS HARRIET G. WAITE, Prin. Freeland Street School, Worcester, Mass.

WALTER P. WHITE, A. B., Teacher of Sciences, Oshkosh High School, Oshkosh, Wis.

HENRY WHITTEMORE, Supt. of Schools, Waltham, Mass.

JOSEPH H. WIGHT, B. S., Medfield, Mass.

MISS LILLIE A. WILLIAMS, Teacher of History and Psychology, New Jersey State Normal School, Trenton, N. J.

MRS. KATE E. WILSON, Teacher of Natural Science, Howard Seminary, West Bridgewater, Mass.

Besides those attending the full course, 65 others attended lectures and exercises in special subjects.

CLARK UNIVERSITY,

WORCESTER, MASS.

REGISTER

AND

Sixth Official Announcement.

WORCESTER, MASS.:
PUBLISHED FOR THE UNIVERSITY.
May, 1894.

CALENDAR: 1894-95.

1894.

JUNE 21. Thursday. Present academic year ends.

OCT. 2. Tuesday. Sixth academic year begins.

DEC. 24. Monday.
1895.
JAN. 2. Wednesday. } Christmas Recess.

Date of the Spring Recess and close of next academic year to be determined later.

MEMBERS.

G. STANLEY HALL, PH. D., LL. D., President of the University. 94 Woodland St.

A. B., Williams College, 1867, and A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888, and Williams College, 1889; Resident Fellow of the American Academy of Arts and Sciences.

WILLIAM E. STORY, PH. D., Professor of Mathematics. 17 Hammond St.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CLIFTON F. HODGE, PH. D., Assistant Professor of Physiology and Neurology. 11 Tirrell St.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92.

EDMUND C. SANFORD, PH. D., Assistant Professor of Psychology. 21 Oread St.

A. B., University of California, 1883; Fellow of Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888.

HENRY TABER, PH. D., Assistant Professor of Mathematics. 9 Oread Place.

Ph. B., Yale (Sheffield Scientific School), 1882; Ph. D., Johns Hopkins University, 1888, and Assistant in Mathematics, Johns Hopkins University, 1888-89; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

ARTHUR G. WEBSTER, PH. D., Assistant Professor of Physics. 936 Main St.

A. B., Harvard, 1885; Instructor in Mathematics, Harvard, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890.

WILLIAM H. BURNHAM, PH. D., Instructor in Pedagogy. 100 Chatham St.

A. B., with honors in Philosophy, Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor in the State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89.

SAMUEL P. MULLIKEN, PH. D., Instructor in Chemistry. 19 Richards St.

S. B., Mass. Institute of Technology, 1887; Assistant in Chemistry, University of Cincinnati, 1887-88; Ph. D., University of Leipzig, 1890; Fellow in Chemistry, Clark University, 1890-91; Associate in Chemistry, Bryn-Mawr College, Bryn-Mawr, Pa., 1891-92; Instructor in Clark University, 1892.

ALEXANDER F. CHAMBERLAIN, PH. D., Lecturer in Anthropology. 20 Grand St.

B. A., University of Toronto, Canada, 1886; M. A., University of Toronto, 1889; Fellow (tutorial and post-graduate work) in Modern Languages in University College, Toronto, 1887-90; Examiner in German in University College, and the University of Toronto, 1888-92; Examiner in Modern Languages in the University of Trinity College, Toronto, 1890-91; Examiner in French and German, Department of Education, Ontario, 1888-89; Fellow in Anthropology, Clark University, 1890-92, and Lecturer in Anthropology, 1892; Anthropological Researches in British Columbia under the auspices of the British Association for the Advancement of Science, summer of 1891; Fellow of the American Association for the Advancement of Science.

JOSEPH DE PEROTT, Docent in Mathematics. 15 Florence St.

Universities of Paris and Berlin, 1877-80.

H. AUSTIN AIKINS, PH. D., Toronto, Ont., Honorary Fellow in Psychology. 1018 Main St.

B. A., University of Toronto, 1887; Instructor in University of Southern California, 1888; Yale University, 1888-91; and Lecturer on History of Philosophy in Yale, 1890-91; Ph. D., Yale, 1891; Professor of Logic and Philosophy in Trinity College, N. C., 1891-92; Fellow in Psychology, Clark University, 1892-94.

PERCY NORTON EVANS, PH. D., Montreal, Canada, Honorary Fellow in Chemistry. 84 Woodland St.

B. A. Sc., McGill University, Montreal, 1890; Assistant in Chemistry, 1890-91; University of Leipzig (Exhibition of 1851, Science Scholar), 1891-93; Ph. D., Leipzig, 1893.

RICHARD J. HOLLAND, PH. D., Cobourg, Ontario, Canada, Honorary Fellow in Physics. 84 Woodland St.

B. A., Victoria College (Toronto), 1887; Certificate Specialist in Science, Teachers' Training Institute, Kingston, 1888; Science Master, Morrisburg, Coll., Inst., 1888-90; Student, Leipzig University, 1890-93; Ph. D., Leipzig, 1893.

ALBERT E. SEGSWORTH, B. A., Toronto, Canada, Honorary Fellow in Psychology. 6 Charlotte St.

B. A., University of Toronto, 1890; Student at University of Leipzig, 1890-91; at University of Toronto, 1891-92; Student at University of Leipzig, 1892-93.

FRANKLIN W. BARROWS, M. D., Buffalo, N. Y., Fellow in Physiology. 25 Bowdoin St.

A. B., Amherst, 1885; Instructor in Sciences, Worcester Academy, 1885-88; A. M., in course, Amherst, 1888; Instructor in Natural Sciences, High School, Buffalo, 1888-Jan., 1894; M. D., University of Buffalo, 1893.

JOHN A. BERGSTRÖM, A. B., Middletown, Conn., Fellow and Assistant in Psychology. 5 Gates St.

A. B., Wesleyan University, Middletown, Conn., 1890; Fellow in Psychology, Clark University, 1891-94.

L. WAYLAND DOWLING, Adrian, Mich., Fellow in Mathematics. 2 Charlotte St.

Adrian College, 1889-90; Principal of Schools, Clayton, Mich., 1891-92; Scholar in Mathematics, Clark University, 1892-93.

FLETCHER B. DRESSLAR, A. M., Banta, Ind., Fellow in Psychology. 17 Freeland St.

A. B., University of Indiana, 1889; A. M., 1892; Instructor in Vincennes University, 1888; Principal of High School, Princeton, Ind., 1889-90; Superintendent, 1890-91; Instructor in Psychology, University of Indiana, 1892; Fellow in Psychology, Clark University, 1892-93.

JOHN H. GRAY, Jr., B. S., Berkeley, Cal., Fellow in Chemistry. 10 Buffum St.

B. S., University of California; Assistant to State Analyst (of California), 1887-90; Assistant in Chemistry, University of California, 1889-90, and Instructor in Chemistry, 1890-92; Fellow in Chemistry, Clark University, 1892-93.

JOHN E. HILL, PH. B., Mystic, Conn., Fellow in Mathematics. 44 Richards St.

Ph. B., Yale, 1885; Resident Engineer, C. M. & St. P. R. R., 1885-88; Professor of Mathematics, Louisville Military Academy, Louisville, Ky., 1888-89; Superintendent of Schools, Pleasantville and Pleasantville Station, N. Y., 1889-90; Professor of Mathematics and Civil Engineering, Highland Park College, Des Moines, Ia., 1890-92; Fellow in Mathematics, Clark University, 1892-93.

HERBERT G. KEPPEL, A. B., Zeeland, Mich., Fellow in Mathematics. 2 Charlotte St.

A. B., Hope College, Holland, Mich., 1889; Teacher of Mathematics, Northwestern Classical Academy, Orange City, Ia., 1891-92; Scholar in Mathematics, Clark University, 1892-93.

CLARENCE ARTHUR SAUNDERS, M. A., Florenceville, N. B., Canada, Fellow in Physics. 2 Charlotte St.

B. A., King's College, Windsor, Nova Scotia, 1885; M. A., Nova Scotia, 1888; Johns Hopkins University, 1889-92; Assistant to Prof. Langley, Smithsonian Institution, 1891-92; Fellow in Physics, Clark University, 1892-93.

OSCAR CHRISMAN, A. M., Gonzales, Texas, Fellow in Pedagogy. 19 Shirley St.

Teacher in Public Schools of Indiana, 1876-1883; Principal, 1883-85; A. B., Indiana University, 1888, and A. M., 1893; Principal, Longfellow School, Houston, Texas, 1888-89; Superintendent of Public Schools, Gonzales, Texas, 1889-92; Fellow in Pedagogy, Clark University, 1892-93.

FRANK DREW, A. M., Fellow in Psychology. 70 Florence St.

Superintendent of Schools, Genoa, Ill., 1887-89; A. B., University of Indiana, 1890, and A. M., 1891; Student in Psychology, Clark University, 1892-93.

JOHN A. HANCOCK, M. A., Green Bay, Wis., Fellow in Pedagogy. 8 Gates St.

B. S., Baker University, 1877; M. L., University of Wisconsin, 1890; M. A., Stanford University, 1893; School Teacher, 1877-81; Supervising Principal of Schools, Farmland, Ind., 1881-85, and at Elroy, Wis., 1885-89; Student in Pedagogy, University of Wisconsin, 1889-90; City Superintendent, Green Bay, Wis., 1890-92; Student in Pedagogy, Leland Stanford, Jr., University, 1892-93.

JAMES H. LEUBA, PH. B., Fellow in Psychology. 8 King St.

B. S., Neuchâtel, Switzerland, 1886; Ph. B., Ursinus College, Pa., 1888; Teacher of the French Language, St. Mark's School, Southboro, Mass., 1891-92; Scholar in Psychology, Clark University, 1892-93.

THOMAS F. NICHOLS, A. B., Phippsburgh, Me., Fellow in Mathematics. 4 Lowell St.

A. B., Bowdoin College, 1892; Scholar in Mathematics, Clark University, 1892-93.

JAMES R. SLONAKER, B. S., Farmland, Ind., Fellow in Biology. 8 Gates St.

Graduate Indiana State Normal School, 1889; Supervising Principal of Schools, Elroy, Wis., 1889-91; B. S., University of Wisconsin, 1893.

F. E. STINSON, Fellow in Mathematics. 84 Woodland St.

Iowa Agricultural College, 1884-86; Principal of the Poplar Grove (Ark.) Institute, 1889-90; Teacher of Physics and Mathematics, Paris (Ark.) Academy, 1890-92; Scholar in Mathematics, Clark University, 1892-93.

S. N. TAYLOR, PH. B., Farmingdale, N. Y., Fellow in Physics. 67 Florence St.

Ph. B., Wesleyan University, Middletown, Conn., 1887; in Charge of Experimental Laboratory, Thomson-Houston Electric Works, Lynn, Mass., 1887-91; Professor of Natural Sciences, Maine Wesleyan Seminary and Female College, 1891-93.

JULIUS B. WEEMS, Solomons, Md., Fellow in Chemistry. 70 Florence St.

Maryland Agricultural College, 1888; Instructor in Chemistry and Mathematics, in same, 1888-89; Johns Hopkins University, 1889 91; Chemist at Phosphate Mines, Fla., 1891-92; Fellow in Chemistry, Clark University, 1892.

R. AKIYAMA, Tokio, Japan, Scholar in Chemistry. 70 Florence St.

School of Science, Tokio, Japan, 1888-90; College of Pharmacy, San Francisco, Cal., 1890-91; University of California, 1891 93.

WARREN G. BULLARD, A. B., Geneva, N. Y., Scholar in Mathematics. 4 Lowell St.

A. B. (with honors in Mathematics), Brown University, 1892; Instructor in Mathematics in Elmira Free Academy, Elmira, N. Y., 1892-93.

GEO. ELLSWORTH JOHNSON, A. M., Springfield, Vt., Scholar in Pedagogy. 23 Benefit St.

A. B., Dartmouth, 1887; A. M., 1891; Principal, Colebrook (N. H.) Academy, 1887-88; Principal of Schools, Springfield, Vt., 1888-92; Student, Hartford Theological Seminary, 1892-93.

STANLEY H. ROOD, S. B., Worcester, Mass., Scholar in Physics. 30 John St.

S. B., Worcester Polytechnic Institute (in Mechanical Engineering), 1890; (in Electrical Engineering), 1891; Instructor in Physics, Worcester Polytechnic Institute, 1890-93.

ALBERT H. YODER, A. B., Madison, South Dakota, Scholar in Pedagogy. 21 Queen Street.

Teacher in Dakota Public Schools, 1882-87; Graduate State Normal School, 1888; Superintendent of Schools, Madison, South Dakota, 1888 91; A. B., University of Indiana, 1893; Institute Instructor, South Dakota, summers of 1892-93; Editor, Professional Department, of *South Dakota Educator*.

WILLIAM A. HOYT, A. M., Winthrop, Me., Student in Pedagogy. 41 Oread St.

B. A., Bates College, 1880, and A. M., 1884; Principal of High School, Rockport, Me., 1881-82; Principal of Greely Institute, Cumberland, Me., 1882-83; Cornwall Heights School, Cornwall, N. Y., 1883-86; Principal of High School, Medway, Mass., 1886-1888; North Brookfield, Mass., 1888-1892; Augusta, Me., 1892-93.

A. MARDEROS IGNATIOS, Smyrna, Turkey, Student in Psychology. 225 Main St.

Graduate Harpoot Seminary, 1872; Teacher at Agin, 1872-80; Professor of Languages and Turkish Law, Uphradas and Central Colleges, 1880-84; Pastor of Evangelical Churches at Menesonan and Smyrna, Turkey, 1884-93.

JAMES JENKINS, A. M., Worcester, Mass., Student in Pedagogy. 59 Providence St.

A. B., Colby University, 1879, and A. M., 1891; Principal of High School, Maynard, Mass., 1878-79, and Ayer, Mass., 1880-82; Instructor in Mathematics, Worcester Academy, 1883-85; Principal Dix St. Grammar School, Worcester, 1885-92; Principal English High School, Worcester, 1892; Member of the American Economic Association.

ALBERT B. KIMBALL, S. B., Worcester, Mass., Student in Physics. 28 Boynton St.

S. B. (Mechanical Engineering), Worcester Polytechnic Institute, 1889, and S. B. (Electrical Engineering), 1890; Teacher of Physics and Mathematics, La Grange (Ill.) High School, 1890-91; Instructor in Manual Training, Brookline, Mass., 1891-92; Teacher of Physics, English High School, Worcester, Mass., since 1892.

JAMES S. LEMON, A. M., Gardner, Mass., Student in Psychology.

A. B., Wesleyan University, 1864; A. M., 1867; Principal of Brownville High School, Professor of Physics, Marion Institute; Principal of Almond Collegiate Institute, Principal of Macedon Academy, all in New York, 1867-80; since 1880, Episcopal Rector and Editor of the Religious Department of the *National Tribune*, Washington, D. C.; Lecturer in Psycho-Physics, Columbian University, Washington, D. C., 1892.

ADMINISTRATION.

The Trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through the three committees named below, and also through the President of the University.

BOARD OF TRUSTEES.

JONAS G. CLARK,

STEPHEN SALISBURY, JOHN D. WASHBURN,
GEORGE F. HOAR, FRANK P. GOULDING,
WILLIAM W. RICE, GEORGE SWAN,
EDWARD COWLES, THOMAS H. GAGE.

OFFICERS.

President,	- -	JONAS G. CLARK.
Vice-Presidents,	-	GEORGE F. HOAR, WILLIAM W. RICE.
Treasurer,	- -	THOMAS H. GAGE.
Secretary,	- -	FRANK P. GOULDING.

COMMITTEES.

Finance.

JONAS G. CLARK, STEPHEN SALISBURY.
JOHN D. WASHBURN, THOMAS H. GAGE.

Buildings.

JONAS G. CLARK. JOHN D. WASHBURN.

By-Laws.

JONAS G. CLARK,

WILLIAM W. RICE, STEPHEN SALISBURY,
JOHN D. WASHBURN, GEORGE SWAN.

President.

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees, shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent, or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the corporation, September 26, 1889.

FACULTY.

By action of the Trustees, the Faculty Staff has been organized as follows:

I. University Senate.

Whose duty it is to elect fellows and to take action upon general requirements for the Doctor's degree and other promotions, and to act and advise upon matters officially submitted to them.

II. General Faculty.

Whose duty it is to consider all matters not otherwise provided for, and in which all departments of the University are alike interested.

III. The Library Committee.

To be appointed by the President or Trustees, the duty of which shall be to advise concerning the arrangement, cataloguing and use of books and other matters pertaining to the library not reserved to the Trustees or otherwise provided for.

GENERAL STATEMENTS.

The University now consists of a group of five closely related departments, in which all its work and that of instructors, fellows and scholars is grouped. These departments are as follows:

I. Mathematics.
II. Physics.
III. Chemistry.
IV. Biology.
V. Psychology.

In addition to these *Education* is now a sub-department.

Admission.

Only graduate students are admitted, or those of equivalent attainments, unless in rare and special cases. At present no entrance examinations are required, but, by testimonials, diplomas, personal interviews or written specimens of work, the authorities must be satisfied that the applicant has scholarship enough to work to advantage, and zeal and ability enough to devote himself to his chosen

field. The methods of the University are too costly, and its energy and funds too precious to be spent upon men who are not well trained, promising, and in earnest.

It is highly desirable, and will probably before long be required, that candidates entering any of the five departments shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges, and to supply every incentive possible in the way of books, facilities, and above all, direct personal stimulus and instruction. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction.

Classes of Appointees.

No clearly marked line exists between students and instructors. Fellows and scholars who have attained some degree of mastery in a special line of work give brief special courses, which are often attended by professors. This is a stimulus to the student, and both tests and exhibits his power in teaching. This and the custom of instructors of

attending each other's lectures, add interest and efficiency to the work of the University.

I. Docents.

The highest annual appointment is that of Docent. These positions are primarily honors, and are reserved for a few men whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. They are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qualify them still more fully for academic advancement.

These positions are now official appointments. Appointees, or others found worthy, however, may be formally invested with the *licentia docendi*, the terms of which can now be furnished on application and which requires a memoir or essay representing original work in their own department, but no examination. This highest formal academic honor will be strictly reserved for those of marked

scientific attainment and teaching ability, and so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that by the existence of such a select body of men of guaranteed scientific training, ability and approved power to teach, the difficulties under which college trustees sometimes succumb in selecting suitable men for their professors may be diminished, and that otherwise this new grade will aid in raising standards of academic scholarship in colleges and in encouraging scientific research here. Good men of this class may be paid a salary.

II. Candidates for the Degree of Doctor of Philosophy.

In most cases it is probable that three, or at least two, years of graduate work will be necessary for this degree. Examinations for it, however, may be taken at any time when, in the judgment of the University authorities, the candidate is prepared. A pre-arranged period of serious work at the University itself is indispensable.

For this degree the first requirement is a thesis upon an approved subject, to which it must be an

original contribution of value. To this, capital importance is attached. It must be reported on in writing by the chief instructor, printed at the expense of the candidate, and at least one hundred copies given to the University. In case, however, of theses of very unusual length, or containing very expensive plates, the academic Senate shall have power, at the request of the candidate, to reduce this number of presentation copies to 50. Each of these copies shall bear upon it in print the statement of the chief instructor, that it is a thesis for the Doctor's degree in his department at Clark University.

Such formal or informal tests as the academic Senate shall determine shall mark the acceptance of each student or fellow as a candidate for this degree.

One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede by not less than three months and not more than one year the examination itself, and the nature and result of this test shall be made matter of record.

The fee for the Doctor's degree is $25, and in every case it must be paid and the presentation

copies of the thesis must be in the hands of the Librarian before the diploma is given. In exceptional cases, however, and by special action of the Senate, the ceremony of promotion may precede the presentation of the printed copies of the thesis. The latter, however, must always precede the actual presentation of the diploma.

An oral but not a written examination is required upon at least one minor subject in addition to the major, before an examination jury, composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Senate, who, if they are also satisfied, may recommend the candidate for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained. They desire that the standard requirements for it be kept the highest practicable, that it be reserved for men of superior ability and attainment only, and that its value here be never suffered to depreciate.

It is to the needs of these students that the lectures, seminaries, laboratories, collections of books,

apparatus, etc., are specially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

III. Special Students not Candidates for a Degree.

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes those who may desire to devote themselves exclusively to one or more of the special branches — mathematics, physics, chemistry, biology, psychology, or education, — but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

IV. Preliminary Candidates.

Non-university students of less special or less advanced standing than the above three classes, who are nearly, if not quite, qualified to become candidates for the degree of Doctor of Philosophy, may also be received.

Students of this class must for the present have completed the work of the first three years of a regular under-graduate course in a college of good standing, or the equivalent thereof. They must satisfy the authorities of the University of their attainments, and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may in exceptional cases be elected to Scholarships.

The Clark Fellowships and Scholarships.

10 Fellowships of $600 per year.
10 Fellowships of $400 per year.
10 Scholarships of $200 per year.
10 Scholarships of $100 per year.

In general these appointments may perhaps represent the successive stages of approximation to

the Doctor's degree, the highest Fellowships being commonly given to men within a year of that degree. Those who have already taken the Doctor's degree or those not intending to do so, may be appointed to Fellowships and Scholarships. *All Fellows and Scholars pay full tuition of* $200.

The founder of the University and his wife unite with the Trustees and President in inviting sympathy and practical coöperation in the multiplication of such aids, large or small, temporary or permanent, here at the outset.

A Citizen's Fund.

In addition to this a citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

The Field Fund.

Mrs. Eliza W. Field has also given $500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

Purpose and Conditions of Fellowships and Scholarships.

Fellowships at Clark University are intended for young men of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

Applications should state the candidate's course of study and be accompanied by testimonials or diplomas, should indicate a decided preference for some special department, and if possible be accompanied by some specimen of his work for the aid of the Board of Selection. Applications will be considered in June and in October, and should be in the hands of the President on or before the first of these months. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year and devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must coöperate in promoting harmony, order and all the ends of the University, must not teach elsewhere and may be reappointed at the end of the year. Because intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

Both Scholarships and Fellowships are open only to students in one or more of the five departments announced.

METHODS.

Besides field work, excursions to institutions public and private, coaching and cram-classes, clubs, examinations, conferences and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus and references to standard text-books, and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will from time to time be given.

SEMINARIES. These are stated meetings for joint, systematic work, under the personal direction of the professor, in some special part of his subject. Here the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given, many important works have proceeded, and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this was from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, methods discussed and perfected, with a view to developing that independence in re-

search which is the consummation of scientific culture.

NOTICES.

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $200 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will, so far as possible, be informed upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Mr. Louis N. Wilson, Worcester, Mass.

DEPARTMENTS.

The statements of the instructors concerning the courses to be given during the academic year 1894-95, which follow, are supplemented by a fuller account of the past and present work of each department contained in the third Report of the President and Departments, April, 1893.

Further announcements may be made later.

I.

MATHEMATICS.

Programme for 1894–95.

The introductory courses are given in alternate annual groups, as follows :

Group A (to be given in 1894-95):

Analytic Geometry of Conic Sections, Quadric Surfaces, and Higher Plane Curves; 3 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables and Definite Integrals; 3 hours a week, through the year.

Theory of Numbers; 2 hours a week, first half-year.

Modern Synthetic Geometry; 2 hours a week, second half-year.

Group B (not given in 1894-95):

Analytic Geometry of Conic Sections, Quadric Surfaces, and Higher Plane Curves; 3 hours a week, through the year.

Elliptic Functions, Differential Equations, and Calculus of Variations; 3 hours a week, through the year.

Algebraic Substitutions and their Applications to the Theory of Equations; 2 hours a week, first half-year.

Analytic Geometry of Higher Surfaces and Twisted Curves; 2 hours a week, second half-year.

Algebraic Invariants; 2 hours a week, first half-year.

It will be observed that the first course in each group is the same; that course alone is given annually, while

the other courses are given but once in two years. It is expected that every student will take each course (unless he has already completed an equivalent course elsewhere) in the earliest year of his residence in which it is given. These courses are briefly described in the *Third Report of the President and Departments* (April, 1893). Their chief object is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, the conic sections and quadric sur faces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types.

A *Seminary* will be conducted in connection with each group, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1894-95, the following courses are offered:

BY PROFESSOR STORY.

Advanced courses:

RATIONAL AND UNIFORM TRANSFORMATIONS OF CURVES AND SURFACES; 4 hours a week, first half-year.

SEMINARY FOR ADVANCED STUDENTS; through the year.

THEORY OF FINITE AND CONTINUOUS GROUPS; 3 hours a week, second half-year.

Introductory course (of Group A):

MODERN SYNTHETIC GEOMETRY; 2 hours a week, second half-year.

BY ASSISTANT PROFESSOR TABER.

Introductory courses (of Group A):

ANALYTIC GEOMETRY OF CONIC SECTIONS, QUADRIC SURFACES, AND HIGHER PLANE CURVES; 3 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, AND DEFINITE INTEGRALS; 3 hours a week, through the year.

A SEMINARY in connection with these introductory courses; through the year.

BY M. DE PEROTT.

Advanced course:

RIEMANN'S SURFACES AND ABELIAN INTEGRALS; 2 hours a week, second half-year.

Introductory course (of Group A):

THEORY OF NUMBERS; 2 hours a week, first half-year.

Other advanced courses may be announced later.

For further details concerning the department (members and courses of instruction in past years, general policy of the department, library facilities, and apparatus), see the *Third Report of the President and Departments*, pp. 17-63.

II.

PHYSICS.

This department is under the direction of ASSISTANT PROFESSOR ARTHUR G. WEBSTER, Ph. D., who will regularly deliver, with a period of either two or three years, the following cycle of courses:—

(1) DYNAMICS. — GENERAL METHODS, CANONICAL EQUATIONS, SYSTEMS OF PARTICLES, RIGID BODIES.

(2) ELASTICITY, HYDRODYNAMICS, OSCILLATORY AND WAVE MOTION, DYNAMICAL BASIS OF SOUND AND LIGHT.

(3) OPTICS.—Physical and Geometrical.

(4) THERMODYNAMICS, KINETIC THEORY OF GASES.

(5) POTENTIAL, ELECTRICITY AND MAGNETISM.

(6) THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS. Laplace's Equation, Equation of Thermal and Electrical Conduction, Equation of Wave Motion, Telegrapher's Equation, Developments in Series. Legendre's, Laplace's, Bessel's, and Lamé's Functions.

The courses for the year 1894-95 will be 1, 2, and 5. In addition to the above regular courses, advanced courses will, from time to time, be given on such subjects as Attraction of Ellipsoids, Figure of the Earth, Theory of Tides, and Theory of Sound.

The aim of the department is to ensure in the students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact

measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research, he will at all times have the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches, and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance, may be

mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat, the steady flow of electricity, certain cases in hydrodynamics and sound, or in the theory of magnetic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "spin," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy, and it is attempted, so far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the Calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the

properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable text-books for preparation, may be recommended to the student Greenhill's, Williamson's, or Byerly's Differential and Integral Calculus, W. B. Smith's Analytic Geometry, and Hanus' Determinants.

A fuller account of the above courses of lectures, as well as a description of the facilities of the department, and a statement of the requirements for the Doctor's degree, may be found in the *Report of the President and Departments* for 1893.

III.

CHEMISTRY.

The Department of Chemistry offers to the student who is prepared to begin graduate work a series of regularly recurring laboratory and lecture courses, so combined with special advanced courses of a less permanent character that all graduate subjects required in the examination for the Doctor's degree will be presented within the space of two years. The laboratory courses and lectures on Organic and some branch of Theoretical Chemistry will be given each year. The special courses will vary from year to year.

LECTURE COURSES FOR 1894-95.

I. Organic Chemistry.—Methods of organic analysis and molecular-weight determination, physical properties of organic compounds, chemistry of the aliphatic compounds and of bodies containing the simpler rings; chemistry of the aromatic compounds, including the derivatives of pyridine and quinoline and the terpenes. Two lectures a week during the whole year.

II. Recent History of Chemistry. — After a few introductory lectures on the earlier history of chemistry, special attention will be given to the development of chemical theory since the year 1840. The history of chemical instruction will be among the topics discussed. A limited amount of seminary work will accompany the lectures. One lecture a week during one half-year.

III. Chemistry of the Non-Metals. — An advanced course, with special reference to recent work. One hour a week for one half-year.

IV. Journal Meetings, in which important contributions to the current chemical literature are reported and informally discussed, will be held once a week throughout the year.

LABORATORY COURSES.

As a rule only such men will be admitted to this department as have already completed a good college course in Chemistry, and are practically acquainted with the ordinary analytical methods; but since the majority of our colleges do not yet give sufficient training in the methods employed in making organic preparations and analyses to render it possible for their graduates to begin upon research work in Organic Chemistry immediately, the following introductory laboratory courses (V.), — which are also suitable for minor subjects, — have been instituted, and are offered yearly:—

V. (a) Quantitative Analysis.
(b) Molecular-weight Determination.
(c) Organic Preparations.

VI. Chemical Research.— As soon as a student has obtained the necessary preliminary training in the subjects represented in course V., he may begin upon some scientific research under the direction of an instructor. The subject chosen for investigation may originate with the student, or may be proposed by the instructor, but must be one that meets the approval of the head of the department. When sufficient material for a satisfactory dissertation has been collected and the other requirements have been fulfilled, the candidate for the degree of Ph. D. may pre-

sent himself for examination. The time required for this course varies much with different students, but is usually at least two years, when 30-40 hours are spent in the laboratory each week.

The laboratory and library are open at all hours during the day, and afford every facility for advanced work. An account of the past work and present facilities of the Chemical Department may be found in the *Report of the President and Departments of Clark University*, for 1893, pp. 79-90.

IV.

BIOLOGY.

Programme of Work for Year 1894–95.

Dr. Hodge will offer the following courses :

I. General Biology. — This course is intended to give in general outline the fundamental principles of biological science. The most general classification of plants and animals will be given with description of structural and physiological characteristics, through a series of typical organisms. The topics: origin of living matter, organization, growth and reproduction, heredity, differentiation and evolution will be given special prominence throughout the course. One lecture weekly, October to January. Laboratory work will be arranged to suit the requirements of those taking the course.

II. Comparative Study of Nervous Systems and Sense Organs. — The point of view of this course will be both anatomical and physiological. It is intended to begin with a study, as far as possible comparative, of the structural elements of the nervous system in both invertebrates and vertebrates. Following this, it is proposed to consider the structure and functions of the nervous system in a series of animals, beginning with the cœlenterata and ascending through the mollusca, vermes, tunicata, arthropoda and vertebrates. The course will be illustrated, so far as possible, by diagrams, models, dissections and experiments. One lecture weekly throughout the year.

It is desired in connection with the above courses to hold a seminary in the history of biological science, to meet one

evening weekly for the first half-year. The special aim of this shall be, not so much to cover the entire field, but to study methods of biological research as exemplified in the work of the men who have achieved epoch-making advances in the science. Papers may be prepared by members of the seminary, and these will naturally form a nucleus for general and informal discussion.

PHYSIOLOGY AND NEUROLOGY.

It is intended to arrange physiological courses in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work.

The general subject will include lectures, reading courses, demonstrations and laboratory work in the following lines:—

1. Muscle and nerve.
2. Nutrition, including digestion, blood and lymph, circulation and respiration, and excretion.
3. Brain.
4. Skin and sense organs.
5. Reproduction.

During the work in each of these divisions, the microscopical structure of the organs concerned as well as the physiological chemistry connected with their action, will receive special attention.

Courses in physiology for the year 1894–95 will be offered as follows:—

III. NUTRITION, consisting of division 2, above. The course will extend throughout the year, and consist of lectures, dem-

onstrations and laboratory work, arranged to meet the requirements of members of the department.

IV. Reproduction.

In addition to the above the following special courses will be offered :—

V. Embryology of the Human Brain and Sense Organs.— Six lectures, with demonstrations and literature.

VI. Cerebral Localization.—Six lectures to be given near the close of the year. The subject will be treated in the order of its historical development.

VII. Muscle and Nerve Physiology.—This subject will not be repeated, in extenso, until 1895-96; but in case there is demand for it, a limited number of lectures and demonstrations will be given during the spring of next year.

VIII. Practical Histology of the Nervous System.— A purely laboratory course, with such directions and conferences as may be required by individual students. Considerable latitude will be given, so that those who wish may make it a comparative study by way of supplementing Course II., or devote their time to special problems.

Experimental Work.

Laboratory work in both physiology and neurology will be arranged to suit the needs and purposes of each member of the department. As soon as practicable each student is expected to undertake an original research. It is hoped that men coming to the laboratory to study will have problems in which they are already interested. In case, however, they have not, work adapted to their qualifications will be assigned. A considerable amount of valuable material has already accumulated in the laboratory, and is waiting to be

worked up. A course in biology, such as is now given in the undergraduate department of many of our colleges and state universities, is sufficient to fit students to begin laboratory work here.

JOURNAL CLUB. It is intended to hold weekly journal club meetings, if possible, for the purpose of reporting and discussing important articles in the current periodicals.

V.

PSYCHOLOGY.

A complete course in Psychology at Clark University includes the following subjects:—

I. Anatomy and physiology of the brain and spinal cord; senses; and other parts of the body, especially the muscles; the organs of the will, so far as they affect psychological powers and processes. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and experimental psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-Times, Memory and Attention. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Abnormal and morbid psychology, as nature's experiments, *e. g.*, border-line phenomena as seen in neurotic people, prodigies and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's clinic and lectures below.

IV. Anthropological psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive Art, and the study of the life of savages and children; Adolescence and senescence; physical measurements

illustrating laws of growth in size and power, etc. See Dr. Chamberlain's laboratory and courses.

V. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VI. History of psychology and philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally.

VII. Applications of psychology; pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sexual problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do in two or three years.

For a full statement of what has been done in this department from the opening of the University down to its date, see the *Report of the President and Departments*, April, 1893.

During the academic year 1894–95, the following courses will be given:—

PROFESSOR G. STANLEY HALL'S COURSES.

I. CONTEMPORARY PHILOSOPHY, including logic, ethics, psychology and allied branches. In logic the work of the chief writers of the last few decades will be described, and the logic of the methods of the different branches of science will be characterized. In ethics and psychology the survey will include concise accounts of more recent books, men, and conclusions. There will be throughout reference to the work of the two previous years on the history of philosophy, and incidental reference to current and desirable modes of teaching each philosophic discipline.

II. Morbid Psychology. — Each of the chief forms of mental alienation will be characterized in connection with clinics held at the asylum. Special reference will be had to symptoms which border upon normal psychic life, and are therefore more common with reference to the utilization of these studies in education.

III. A Special Course, with experimental demonstrations covering the psycho-physics of the five senses, and time and space. For this course the resources of the laboratory will be fully utilized, and practice work given.

IV. Education. — The work of the next year will consist largely of a summary of what is known of the nature of childhood and youth as applied to the organization and curricula, branch by branch, of school and college.

V. The Seminary will be organized and its work shaped, as heretofore, by the needs and wishes of those who may be admitted to it.

VI. Research Work in library, school and laboratory, upon problems carefully prepared beforehand with the coöperation of Drs. Sanford and Burnham, will be suggested, and aid offered to all who desire and are found qualified. To this great importance is attached, and special individual coöperation is regarded by all the instructors of the department as a prime object in their work.

VII. Students' Lecture Courses.—Students usually give one or more lectures, open to members of the University, upon topics to which they have given particular attention during the year. These courses have been both valuable and attractive.

Dr. Sanford's Courses.

A. Lectures on Recent Psychology and Psychologists.—The object of this course will be: first, to present a concise account of the work of typical psychologists since Kant; and second, to sketch the development and solution, so far as any has been reached, of typical psychological prob-

lems. It is hoped by this means to make clear both the present state of psychological science and its relations to the past.

B. A Practice Course in Psychological Experimentation.—This course will, during the greater part of the year, follow the lines laid down in Dr. Sanford's "Course in Experimental Psychology." After the student has become somewhat experienced in laboratory work, he will be given a problem for experimental solution under competent direction.

C. Additional Lectures may be given upon topics not treated in Course A.

Dr. Chamberlain's Courses.

General, embracing: (a) History, scope and relations of the science of Anthropology. (b) Physical Anthropology. Problems, investigations, results, laboratory work. (c) Ethnography. Races and race-origins. (d) Ethnology, including sociology; origin and development of the arts and sciences; mythology; folk-lore; religions. (e) Linguistics. Race and language. Origin and development of language and of languages. Psychology of language. Gesture-speech and written language. Comparative linguistics. Comparative literature. (f) Criminal and Pathological Anthropology. Ethnic morals. (g) Historical and Archæological. Primitive man and primitive culture. One hour a week throughout the year.

And the following brief special courses:

A. Anthropology and Ethnology of Sex. History and sociology of woman. Woman in art, religion, civilization, etc.

B. The Child amongst Primitive Peoples.

C. Comparative Mythology of America and the Old World.

D. Psychology of Primitive Languages.

E. Comparative Literature. The beginnings of art in language.

F. The Æsthetical Ideas of Primitive Peoples.

The lectures in anthropology will have special bearing upon the courses in psychology and pedagogy in the University, as may be seen from the outline given above.

From time to time reviews of the most important current literature will be made and students acquainted with the best contributions to anthropological science in the various foreign languages.

The American Journal of Psychology is published by this department, and is in part designed as a medium of publication for the work of members of it.

VI.

EDUCATION.

This has been made a sub-department and now offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with the work in psychology and anthropology, and in part based on these. The work in this department is intended to meet the needs of the following classes of men:

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Educational Department includes courses upon the following subjects:—

I. (a) Child-Study. (b) Educational Psychology. (c) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus etc.

III. (a) Organization of Schools in Different Countries. (b) Typical Schools and Special Foundations.

(c) Motor Education, including manual training, physical education, etc. (d) Moral Education. (e) Ideals.

IV. Higher Education, including university work, technical education; training in law, medicine, and theology; recent progress, present state and prospects of the most advanced education in different countries, including our own.

The courses in education for 1894–95 will be as follows :—

Professor G. Stanley Hall's Courses.

The Nature of Childhood and Youth. Cf. Psychology IV.

Organization and Curricula of School and College.

Dr. Burnham's Courses.

A.—Principles of Education.—This course involves the study of important chapters in the history of education and an account of a few representative educational leaders—Plato Erasmus, Montaigne, Luther, Comenius, Rousseau, Pestalozzi, Froebel, Kant, Fichte, Herbart. Educational ideals. The state and education. The field of scientific study in education. Present problems and tendencies. Once a week, half a year.

B.—Educational Psychology.—Some of the most important chapters in psychology in their educational aspects, especially habit, attention and memory. Diseases of memory, experimental investigations and methods of study in relation to memory; education of the senses; judgment, will, feeling, emotion in relation to moral training; education in productive activity. Once a week throughout the year.

C.—Secondary Education.—This course will involve a general study of aims and methods in the different subjects of secondary instruction, discussion of the report of "The Committee of Ten," and comparisons with the French and German programmes for secondary schools. The present problems of secondary education in different countries will also be discussed. Once a week, half a year.

The work of the *Seminary*, once a week throughout the year, will be, for the most part, adapted to individual students. It is hoped that each student will select, after conference with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department is especially rich in foreign educational literature, and considerable illustrative apparatus has been collected. The Worcester Public Library and the library of the American Antiquarian Society are also accessible to students.

The *Pedagogical Seminary* is published by this department and offers facilities for printing digests, reviews and more valuable papers prepared by the members of the department.

For a fuller account of the facilities and history of this department, see the *Report of the President and Departments*, 1893.

LIBRARY.

The University Library now contains 15,500 bound volumes and 1,500 pamphlets, and the reading room receives 239 journals. With the exception of 3,200 Congressional publications and other contributed volumes, the library and the journals represent chiefly the five departments.

The books are grouped as follows:—

A Works of General Reference.
B Journals.
C Mathematics.
D Physics.
E Chemistry.
F Zoölogy.
G Physiology.
H Pathology.
I Psychology.
J Philosophy.
K Ethics.
L Criminology.
M Anthropology.
N Education.
O Botany.

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their room, case, tier and shelf. They comprise in addition to Congressional publications, bound files of magazines, several score of rare old books, a collection of art publications, travels, complete works, sets of reports, histories, biographies, etc.

The library of the University at present consists of six rooms: I. The large general room, containing A, B,

C, D, F, G, H, I, J, K, L, M, and O. II. The journal room. This contains chiefly current numbers of journals and books of reference. The journals are arranged on broad shelves on each side of the room for ready inspection. III. The educational room. This contains all the educational works except state and city reports and college publications, which have a place and a catalogue by themselves. IV. Chemical Library room, containing both the books and periodicals in that department and labeled E. V. A small store room for books not yet placed on the shelves or catalogued. VI. A small room for duplicates, unbound copies of journals, etc. Besides the subject classification, books are arranged in cases, tiers, shelves, etc.

All the privileges of the library are open to all appointees of the University alike.

The library is open from 8 A. M. to 6 P. M., and each member of the University has direct access to every book and journal.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 100,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing about 360 periodicals and 93,000 volumes, has supplemented the scientific publications purchased by the University and all its privileges are accessible without charge.

A Medical Library of 8,000 volumes is also accessible.

By the courtesy of the Librarian of Harvard University and of the Surgeon General's at Washington, books from the libraries under their charge are sent to the Uni-

versity for a limited time; and by the courtesy of S. S. Green of the Worcester Public Library, all the resources of that institution and its facilities for borrowing from distant libraries are available to all members of the University.

LIBRARY RULES.

1. No loud talk is allowed in any part of the library or reading room.

2. Every book shall be returned at the end of three weeks from the time at which it was taken out; at this time it may be renewed for three weeks, unless wanted.

3. Any book may be called in at three days' notice at the discretion of the Secretary of the Library Committee.

4. Any member of the staff may reserve from circulation such books as he deems necessary in connection with the courses given in his department; and these shall be placed by themselves and marked "reserved."

5. Current numbers of periodicals shall not be taken out until they have been in the library two weeks.

6. Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out on Saturdays at 12 M. and may be kept until 9 o'clock the next Monday morning.

7. All dictionaries, cyclopædias, and books of general reference, are permanently reserved.

8. Books of great value may be taken out only by special permission.

BY-LAWS.

The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University, and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

As the efficiency of the University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruc-

tion, shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trutees.

The President of the University shall be the medium of communication between the Trustees and instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

The President shall call and preside over all official meetings of the instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University, and not engaged in the work of instruction; the duties of all such persons shall be assigned, and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

No instructor shall order any books or apparatus, or anything connected with the work of instruction, with-

out the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same, shall be made without the approval of the Board of Trustees or Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

Each instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and coöperation, and shall encourage research by precept, and if possible, by example.

The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee or the President.

These By-Laws, or any one of them, may be changed, amended or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified and held for that purpose.

REGULATIONS.

1. All requisitions for apparatus and books must be made through the University office upon printed blanks provided for that purpose, and, except in the case of docents, signed by a member of the staff.

2. So far as possible orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that of teaching and illustration only.

3. A book shall be kept for each department containing a complete list of apparatus and supplies, with itemized cost. With the aid of this book a complete inventory of the stock shall be made once a year and whenever else the President shall direct.

4. Requisitions for repairs, furniture, plumbing and work about the buildings must be made in writing and with detail, and must be approved by the Building or Finance Committee, or such person or persons as they may authorize. When once thus passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

5. No unappropriated rooms and no part of the University grounds, shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

6. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced

at the office, and for longer absence permission should be obtained beforehand.

7. The Trustees desire that no instructor, docent or fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

The following additional rules were passed by the Board of Trustees, at a meeting held April 4th, 1891, to take effect for the next academic year :

8. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration ; all metal and carpenter work connected with the scientific activity of each department, and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

9. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

10. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the University office.

CLARK UNIVERSITY,

WORCESTER, MASS.

REGISTER

AND

Seventh Official Announcement.

WORCESTER, MASS.
PUBLISHED FOR THE UNIVERSITY.
May, 1895.

CALENDAR: 1895-96.

1895.

JUNE 20. Thursday. Present academic year ends.

OCT. 1. Tuesday. Seventh academic year begins.

DEC. 23. Monday. } Christmas Recess.
1896.
JAN. 2. Thursday. }

Date of the Spring Recess and close of next academic year to be determined later.

MEMBERS.

G. STANLEY HALL, PH. D., LL. D., President of the University. 94 Woodland St.

A. B., Williams College, 1867, and A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888, and Williams College, 1889; Resident Fellow of the American Academy of Arts and Sciences.

WILLIAM E. STORY, PH. D., Professor of Mathematics. 17 Hammond St.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CLIFTON F. HODGE, PH. D., Assistant Professor of Physiology and Neurology. 3 Charlotte St.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92.

EDMUND C. SANFORD, PH. D., Assistant Professor of Psychology. 21 Oread Place.

A. B., University of California, 1883; Fellow of Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888.

HENRY TABER, PH. D., Assistant Professor of Mathematics. 9 Oread Place.

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888, and Assistant in Mathematics, Johns Hopkins University, 1888-89; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

ARTHUR G. WEBSTER, PH. D., Assistant Professor of Physics. 936 Main St.

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890.

WILLIAM H. BURNHAM, PH. D., Instructor in Pedagogy. 100 Chatham St.

A. B., with honors in Philosophy, Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor in the State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89.

ALEXANDER F. CHAMBERLAIN, PH. D., Lecturer in Anthropology. 10 Beaver St.

B. A., University of Toronto, Canada, 1886; M. A., University of Toronto, 1889; Fellow (tutorial and post-graduate work) in Modern Languages in University College, Toronto, 1887-90; Examiner in German in University College, and the University of Toronto, 1888-92; Examiner in Modern Languages in the University of Trinity College, Toronto, 1890-91; Examiner in French and German, Department of Education, Ontario, 1888-89; Fellow in Anthropology, Clark University, 1890-92, and Lecturer in Anthropology, 1892; Anthropological Researches in British Columbia under the auspices of the British Association for the Advancement of Science, summer of 1891; Fellow of the American Association for the Advancement of Science.

JOSEPH DE PEROTT, Docent in Mathematics. 15 Florence St.

Universities of Paris and Berlin, 1877-80.

HERMAN T. LUKENS, PH. D., Philadelphia, Pa., Honorary Fellow in Psychology. 70 Florence St.

A. B., University of Pennsylvania, 1885, A. M., 1888; Student in Halle, Jena and Berlin, 1888-91; Ph. D., Jena, 1891; Teacher of Biology in Northwest Division High School, Chicago, 1891-94.

FRANK E. SPAULDING, PH. D., Groton, Mass., Honorary Fellow in Psychology. 70 Florence St.

A. B., Amherst, 1889; Instructor in the Louisville Military Academy, Louisville, Ky., 1889-90; Instructor and Associate Principal, 1890-91; Instructor in Latin, Amherst Summer School of Languages, Amherst, 1889-90; Student in Leipzig, Paris and Berlin, 1891-94; Ph. D., Leipzig, 1894.

L. WAYLAND DOWLING, Adrian, Mich., Fellow in Mathematics. 12 Wyman St.

Adrian College, 1889-90; Principal of Schools, Clayton, Mich., 1891-92; Scholar and Fellow in Mathematics, Clark University, 1892-94.

FRANK DREW, A. M., Fellow in Psychology. 70 Florence St.

A. B., University of Indiana, 1890; A. M., 1891; Student in Pedagogy, Clark University, 1892-93; Fellow, 1893-94.

THOMAS WILLIAM EDMONDSON, B. A., Philadelphia, Pa., Fellow in Physics. 75 Florence St.

B. A., London, Eng., 1888 (First in Honors and Senior Exhibitioner at London Matriculation, June, 1886); Akroyd Scholar, 1889-90; Senior Mathematical Scholar, Pembroke College, Cambridge, Eng., 1889-91; 18th Wrangler in Mathematical Tripos, Cambridge, 1891; B. A., Cambridge, 1891; Post-Graduate Student in Chemistry, Physics and Botany, Cambridge, 1891; Assistant Tutor in Mathematics and Physics, University Corresp. College, Cambridge, 1889-92; First Class in Intermediate Science Examination, London, 1892.

JOHN E. HILL, PH. B., Mystic, Conn., Fellow in Mathematics. 44 Richards St.

Ph. B., Yale University, 1885; Resident Engineer, C. M. & St. P. R. R., 1885-88; Professor of Mathematics, Louisville Military Academy, Louisville, Ky., 1888-89; Superintendent of Schools, Pleasantville and Pleasantville Station, N. Y., 1889-90; Professor of Mathematics and Civil Engineering, Highland Park College, Des Moines, Iowa, 1890-92; Fellow in Mathematics, Clark University, 1892-94.

GEORGE ELLSWORTH JOHNSON, A. M., Springfield, Vt., Fellow in Pedagogy. 153 Chandler St.

A. B., Dartmouth, 1887; A. M., 1891; Principal, Colebrook (N. H.) Academy, 1887-88; Principal of Schools, Springfield, Vt., 1888-92; Examiner of State Normal School, Randolph, Vt., 1889-90; Supervisor, Windsor County, Vt., 1891; Student, Hartford Theological Seminary, 1892-93; Scholar in Pedagogy, Clark University, 1893-94.

HERBERT G. KEPPEL, A. B., Zeeland, Mich., Fellow in Mathematics. 12 Wyman St.

A. B., Hope College, Holland, Mich., 1889; Teacher of Mathematics, Northwestern Classical Academy, Orange City, Ia., 1891-92; Scholar in Mathematics, Clark University, 1892-93; Fellow, 1893-94.

JAMES H. LEUBA, PH. B., Fellow in Psychology. 58 Woodland St.

B. S., Neuchâtel, Switzerland, 1886; Ph. B., Ursinus College, Pa., 1888, Teacher of the French Language, St. Mark's School, Southboro, Mass., 1891-92; Scholar in Psychology, Clark University, 1892-93; Fellow, 1893-94.

GEORGE W. A. LUCKEY, A. B., Riverside, Cal., Fellow in Psychology. 925 Main St.

A. B., Stanford University, 1894; Teacher in Indiana Public Schools, 1873-78; County Superintendent of Schools, Adams County, Ind., 1878-82; Institute Lecturer (Ind.), summers of 1879-83; City Superintendent of Schools, Decatur, Ind., 1882-87; Supervising Principal, Ontario, Cal., 1889-92; Non-resident Student, University of City of New York, 1889-92; Student in Pedagogy, Leland Stanford, Jr. University, 1892-94; Student in Biology, Hopkins Seaside Laboratory, Pacific Grove, Cal., summers of 1893-94.

THOMAS F. NICHOLS, A. B., Phippsburgh, Me., Fellow in Mathematics. 1 Lowell St.

A. B., Bowdoin College, 1892; Scholar in Mathematics, Clark University, 1892-93; Fellow, 1893-94.

CLARENCE ARTHUR SAUNDERS, M. A., Florenceville, N. B., Canada, Fellow in Physics. 12 Wyman St.

B. A., King's College, Windsor, Nova Scotia, 1885; M. A., 1888; Johns Hopkins University, 1889-92; Assistant to Prof. Langley, Smithsonian Institution, 1891-92; Fellow in Physics, Clark University, 1892-94.

COLIN ALEXANDER SCOTT, B. A., Fellow in Psychology. 45 May St.

College of the City of New York, 1877-78; B. A., Queen's University, Kingston, Ont.; Gold Medallist, with honors in Chemistry, Biology and Geology, 1885; Graduate, Toronto Normal School, 1879; Director of Instruction in Drawing, Kingston High and Public Schools, 1883-84; Instructor in Chemistry, Ladies' Medical College, Kingston, 1886; Science Master, Ingersoll College Institute, 1887; Science Master, Ottawa College Institute, 1887-94; University and Departmental Associate Examiner, 1893-94; Delegate to Royal Canadian Society, 1894; Exhibitor at Royal Canadian Academy and Boston Art Club; Advanced Certificate from Ontario School of Art, 1886.

BENJAMIN F. SHARPE, A. M., Fellow in Physics. 925 Main St.

A. B., Wesleyan University, Middletown, Conn., 1887, and A. M., 1890; Adjunct Professor of Physics and Biology, Randolph-Macon College, Ashland, Va., 1887-91; Scholar, Johns Hopkins University, 1891-94.

JAMES R. SLONAKER, B. S., Farmland, Ind., Fellow in Biology. 2 Hancock St.

Graduate, Indiana State Normal School, 1889; Supervising Principal of Schools, Elroy, Wis., 1889-91; B. S., University of Wisconsin, 1893; Fellow in Biology, Clark University, 1893-94.

F. E. STINSON, Rhodes, Ia., Fellow in Mathematics. 84 Woodland St.

Iowa State College, 1884-87; Principal of the Poplar Grove (Ark.) Institute, 1888-89; Teacher of Physics and Mathematics, Paris (Ark.) Academy, 1890-92; Scholar in Mathematics, Clark University, 1892-93; Fellow, 1893-94.

S. N. TAYLOR, PH. B., Farmingdale, N. Y., Fellow in Physics. 67 Florence St.

Ph. B., Wesleyan University, Middletown, Conn., 1887; in Charge of Experimental Laboratory, Thomson-Houston Electric Works, Lynn, Mass., 1887-91; Professor of Natural Sciences, Maine Wesleyan Seminary and Female College, 1891-93; Fellow in Physics, Clark University, 1893-94.

ALVA ROY SCOTT, Leavenworth, Ind., Honorary Scholar in Psychology. 58 Woodland St.

A. B., De Pauw University, 1886; A. M., 1889; Principal, Leavenworth Schools, 1886-87; McCormick Theological Seminary, Chicago, 1888-91; Pastor, First Presbyterian Church, Hanover, Ill., 1891-93; Studied Charitable Institutions in Europe, 1892; Graduate Student, Harvard University, 1893-94.

WILLIAM P. BOYNTON, A. M., Los Angeles, Cal., Scholar in Physics. 58 Woodland St.

A. B., Dartmouth, 1890; A. M., 1893; Professor of Physics and Chemistry, University of Southern California, 1890-93; Graduate Scholar and Assistant in Physics, Dartmouth College, 1893-94.

WARREN G. BULLARD, A. B., Geneva, N. Y., Scholar in Mathematics. 1 Lowell St.

A. B., (with honors in Mathematics), Brown University, 1892; Instructor in Mathematics in Elmira Free Academy, Elmira, N. Y., 1892-93; Scholar in Mathematics, Clark University, Oct., 1893-Feb., 1894; Instructor in Mathematics and Jurisprudence, St. Lawrence University, Canton, N. Y., Feb.-June, 1894.

ALEXANDER CASWELL ELLIS, A. B., Louisburg, N. C., Scholar in Pedagogy. 84 Woodland St.

A. B., University of North Carolina, 1894; Student in Summer School of Physical Culture, Harvard University, 1894; Head Master, Classical High School, Chapel Hill, N. C., 1891-92.

DANIEL EDWARD PHILLIPS, A. M., Valley Furnace, W. Va., Scholar in Psychology. 925 Main St.

Graduate, West Virginia State Normal School, 1890; Principal, Public Schools, Philippi, W. Va., 1890-91; A. B., University of Nashville, 1892; A. M., 1894; Institute Instructor in W. Va., summer of 1894.

COLIN C. STEWART, Toronto, Canada, Scholar in Physiology 84 Woodland St.

B. A., University of Toronto, 1894.

ALBERT P. WILLS, B. E. E., Waltham, Mass., Scholar in Physics. 75 Florence St.

B. E. E., Tufts College, 1894 (with honors in Electricity).

HENRY R. BAKER, M. A., B. D., Washta, Ia., Student in Psychology. 20 Grand St.

A. B., Iowa College, 1882; A. M., 1885; B. D., Yale University, 1886; Graduate Student in Philosophy, Harvard University, 1890-91; Ordained to Congregational Ministry, 1887.

CALVIN H. ANDREWS, S. B., Worcester, Mass., Special Student in Mathematics and Pedagogy. 173 Lincoln St.

S. B. (Physical and Political Science), Worcester Polytechnic Institute, 1893; Teacher of Physics and Mathematics, English High School, Worcester, Mass., since 1893.

WALTER E. ANDREWS, A. B., Worcester, Mass., Special Student in Mathematics and Pedagogy. 31 Lancaster St.

A. B., Brown University, 1891; Teacher of Latin and Mathematics, Classical High School, Worcester, Mass., 1891-92; Teacher of Mathematics, English High School, Worcester, Mass., since 1892.

EDGAR H. GROUT, A. B., North Brookfield Mass., Special Student in Pedagogy.

A. B., Brown University, 1885; Principal, Wyomanock Seminary, New Lebanon, N. Y., 1885-87; Private Tutor, 1887-88; Principal, Parker Academy, Woodbury, Conn., 1888-92; Principal, High School, North Brookfield, Mass., since 1892.

EDWARD B. HALE, A. B., Brookfield, Mass., Special Student in Pedagogy.

A. B., Dartmouth College, 1887; Principal, High School, Newport, N. H., and Plainville, Mass., 1887-88; Principal, High School, Turner's Falls, Mass., 1888-89; Brookfield, Mass., since 1889.

WILLIAM A. HOYT, A. M., North Brookfield, Mass., Special Student in Pedagogy.

B. A., Bates College, 1880, and A. M., 1884; Principal of High School, Rockport, Me., 1881-82; Principal of Greely Institute, Cumberland, Me., 1882-83; Cornwall Heights School, Cornwall, N. Y., 1883-86; Principal of High School, Medway, Mass., 1886-88; North Brookfield, Mass., 1888-92; Augusta, Me., 1892-93; Student in Pedagogy, Clark University, 1893-94; Superintendent of Schools, Brookfield District (North Brookfield and Brookfield), Mass., since May, 1894.

JAMES JENKINS, A. M., Worcester, Mass., Special Student in Biology. 59 Providence St.

A. B., Colby University, 1879, and A. M., 1891; Principal of High School, Maynard, Mass., 1878-79, and Ayer, Mass., 1880-82; Instructor in Mathematics, Worcester Academy, 1883-85; Principal, Dix Street Grammar School, Worcester, 1885-92; Principal, English High School, Worcester, since Feb., 1892; Member of the American Economic Association.

ALBERT B. KIMBALL, S. B., Worcester, Mass., Special Student in Pedagogy. 28 Boynton St.

S. B. (Mechanical Engineering), Worcester Polytechnic Institute, 1889, and S. B. (Electrical Engineering), 1890; Instructor in Physics, Worcester Polytechnic Institute, 1889-90; Teacher of Physics and Mathematics, La Grange, Ill., High School, 1890-91; Instructor in Manual Training, Brookline, Mass., 1891-92; Teacher of Physics, English High School, Worcester, Mass., since 1892; Student in Physics, Clark University, 1893-94.

ADMINISTRATION.

The Trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through the three committees named below, and also through the President of the University.

BOARD OF TRUSTEES.

JONAS G. CLARK,

STEPHEN SALISBURY,	JOHN D. WASHBURN,
GEORGE F. HOAR,	FRANK P. GOULDING,
WILLIAM W. RICE,	GEORGE SWAN,
EDWARD COWLES,	THOMAS H. GAGE.

OFFICERS.

President, - - -	JONAS G. CLARK.
Vice-Presidents, - -	GEORGE F. HOAR, WILLIAM W. RICE.
Treasurer, - - -	THOMAS H. GAGE.
Secretary, - - -	FRANK P. GOULDING.

COMMITTEES.

Finance.

JONAS G. CLARK, STEPHEN SALISBURY,
JOHN D. WASHBURN, THOMAS H. GAGE.

Buildings.

JONAS G. CLARK, JOHN D. WASHBURN.

By-Laws.

JONAS G. CLARK,
WILLIAM W. RICE, STEPHEN SALISBURY,
JOHN D. WASHBURN, GEORGE SWAN.

President.

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees, shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent, or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the corporation, September 26, 1889.

FACULTY.

By action of the Trustees, the Faculty Staff has been organized as follows:

I. University Senate.

Whose duty it is to elect fellows and to take action upon general requirements for the Doctor's degree and other promotions, and to act and advise upon matters officially submitted to them.

II. General Faculty.

Whose duty it is to consider all matters not otherwise provided for, and in which all departments of the University are alike interested.

III. The Library Committee.

To be appointed by the President or Trustees, the duty of which shall be to advise concerning the arrangement, cataloguing and use of books, and other matters pertaining to the library not reserved to the Trustees or otherwise provided for.

GENERAL STATEMENTS.

The University now consists of a group of five closely related departments, in which all its work and that of instructors, fellows and scholars is grouped. These departments are as follows:

I.	MATHEMATICS.	(Page 25)
II.	PHYSICS.	(" 34)
III.	CHEMISTRY.	(" 42)
IV.	BIOLOGY.	(" 43)
V.	PSYCHOLOGY.	(" 51)

In addition to these *Education* is now a subdepartment. (Page 58)

ADMISSION.

Only graduate students are admitted, or those of equivalent attainments, unless in rare and special cases. At present no entrance examinations are required, but, by testimonials, diplomas, personal interviews or written specimens of work, the authorities must be satisfied that the applicant has scholarship enough to work to advantage, and

zeal and ability enough to devote himself to his chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon men who are not well trained, promising, and in earnest.

It is highly desirable, and will probably before long be required, that candidates entering any of the five departments shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges, and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus and instruction. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction.

Classes of Appointees.

No clearly marked line exists between students and instructors. Fellows and scholars who have attained some degree of mastery in a special line of work give brief special courses, which are often attended by professors. This is a stimulus to the

student, and both tests and exhibits his power in teaching. This and the custom of instructors of attending each other's lectures, add interest and efficiency to the work of the University.

I. Docents.

The highest annual appointment is that of Docent. These positions are primarily honors, and are reserved for a few men whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. They are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qualify them still more fully for academic advancement.

These positions are now official appointments. Appointees, or others found worthy, however, may be formally invested with the *licentia docendi*, the terms of which can now be furnished on application and which requires a memoir or essay repre-

senting original work in their own department, but no examination. This highest formal academic honor will be strictly reserved for those of marked scientific attainment and teaching ability, and so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that by the existence of such a select body of men of guaranteed scientific training, ability and approved power to teach, the difficulties under which college trustees sometimes succumb in selecting suitable men for their professors may be diminished, and that otherwise this new grade will aid in raising standards of academic scholarship in colleges and in encouraging scientific research here. Good men of this class may be paid a salary.

II. Candidates for the Degree of Doctor of Philosophy.

In most cases it is probable that three, or at least two, years of graduate work will be necessary for this degree. Examinations for it, however, may be taken at any time when, in the judgment of the University authorities, the candidate is

prepared. A pre-arranged period of serious work at the University itself is indispensable.

For this degree the first requirement is a thesis upon an approved subject, to which it must be an original contribution of value. To this, capital importance is attached. It must be reported on in writing by the chief instructor, printed at the expense of the candidate, and at least one hundred copies given to the University. In case, however, of theses of very unusual length, or containing very expensive plates, the academic Senate shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty. Each of these copies shall bear upon it in print the statement of the chief instructor, that it is a thesis for the Doctor's degree in his department at Clark University.

Such formal or informal tests as the academic Senate shall determine, shall mark the acceptance of each student or fellow as a candidate for this degree.

One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede by not less than six months and not more than one year the examination itself, and the nature

and result of this test shall be made matter of record.

The fee for the Doctor's degree is $25, and in every case it must be paid and the presentation copies of the thesis must be in the hands of the Librarian before the diploma is given. In exceptional cases, however, and by special action of the Senate, the ceremony of promotion may precede the presentation of the printed copies of the thesis. The latter, however, must always precede the actual presentation of the diploma.

An oral but not a written examination is required upon at least one minor subject in addition to the major, before an examination jury, composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Senate, who, if they are also satisfied, may recommend the candidate for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained. They desire that the standard requirements for it be kept the highest practicable, that

it be reserved for men of superior ability and attainment only, and that its value here be never suffered to depreciate.

It is to the needs of these students that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are specially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

III. Special Students not Candidates for a Degree.

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes those who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, psychology, or education, — but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and com-

petency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

IV. Preliminary Candidates.

Non-university students of less special or less advanced standing than the above three classes, who are nearly, if not quite, qualified to become candidates for the degree of Doctor of Philosophy, may also be received.

Students of this class must for the present have completed the work of the first three years of a regular under-graduate course in a college of good standing or the equivalent thereof. They must satisfy the authorities of the University of their attainments, and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

The Clark Fellowships and Scholarships are as follows:

10 Fellowships of $600 per year.
10 Fellowships of $400 per year.
10 Scholarships of $200 per year.
10 Scholarships of $100 per year.

In general these appointments may perhaps represent the successive stages of approximation to the Doctor's degree, the highest Fellowships being commonly given to men within a year of that degree. Those who have already taken the Doctor's degree, or those not intending to do so, may be appointed to Fellowships and Scholarships. *All Fellows and Scholars pay full tuition of* $200.

The founder of the University and his wife unite with the Trustees and President in inviting sympathy and practical coöperation in the multiplication of such aids, large or small, temporary or permanent, here at the outset.

A Citizen's Fund.

In addition to this, a citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who

may desire to avail themselves of the advantages of the institution."

The Field Fund.

Mrs. Eliza W. Field has also given $500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

Purpose and Conditions of Fellowships and Scholarships.

Fellowships at Clark University are intended for young men of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

Applications should state the candidate's course of study and be accompanied by testimonials or

diplomas; should indicate a decided preference for some special department, and, if possible, be accompanied by some specimen of his work for the aid of the Board of Selection. Applications will be considered in June and in October, and should be in the hands of the President on or before the first of these months. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year and devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must coöperate in promoting harmony, order and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Because intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

Both Scholarships and Fellowships are open only to students in one or more of the departments announced.

METHODS.

Besides field work, excursions to institutions public and private, coaching and cram-classes, clubs, examinations, conferences and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus and references to standard text-books, and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will from time to time be given.

SEMINARIES. These are stated meetings for joint, systematic work, under the personal direction of the professor, in some special part of his subject. Here the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the

mutual stimulus thus given, many important works have proceeded, and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this was from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES.

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $200 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will, so far as possible, be informed upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Mr. Louis N. Wilson, Worcester, Mass.

The following are the statements and announcements of the department for the current year, 1895–6 :—

I.

MATHEMATICS.

Programme for 1895–96.

INSTRUCTION IN MATHEMATICS.

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they do not recognize their ability to engage successfully in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a very large number of different branches of mathematics, conversant with the detailed results and tne literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses are given in alternate annual groups, as follows:

Group A (not given in 1895-96):

ANALYTIC GEOMETRY OF CONIC SECTIONS, QUADRIC SURFACES, AND HIGHER PLANE CURVES; 3 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES AND DEFINITE INTEGRALS; 3 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, first half-year.

MODERN SYNTHETIC GEOMETRY; 2 hours a week, second half-year.

Group B (to be given in 1895-96):

ANALYTIC GEOMETRY OF CONIC SECTIONS, QUADRIC SURFACES, AND HIGHER PLANE CURVES; 3 hours a week, through the year.

ELLIPTIC FUNCTIONS, DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 3 hours a week, through the year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATIONS TO THE THEORY OF EQUATIONS; 2 hours a week, first half-year.

ANALYTIC GEOMETRY OF HIGHER SURFACES AND TWISTED CURVES; 2 hours a week, second half-year.

ALGEBRAIC INVARIANTS; 2 hours a week, first half-year.

It will be observed that the first course in each group is the same; that course alone is given annually, while the other courses are given but once in two years. It is expected that every student will take each course (unless he has already completed an equivalent course elsewhere) in the earliest year of his residence in which it is given. The chief object of these courses is to make the student familiar with the various methods of mathe-

matical research and the concepts of mathematical thought at the present day. Thus, for example, the conic sections and quadric surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparations for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types.

A *Seminary* will be conducted in connection with each group, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1895-96, the following courses are offered :—

BY PROFESSOR STORY.

Advanced courses:

ANALYTIC GEOMETRY OF PLANE CUBIC AND QUARTIC CURVES; 2 hours a week, first half-year.

ANALYTIC GEOMETRY OF CUBIC AND QUARTIC SURFACES AND RULED SURFACES; 2 hours a week, second half-year.

HYPERSPACE AND NONEUCLIDEAN GEOMETRY; 2 hours a week, first half-year.

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses (of Group B):

ALGEBRAIC INVARIANTS AND HIGHER ALGEBRA; 2 hours a week, first half-year.

ANALYTIC GEOMETRY OF HIGHER SURFACES AND TWISTED CURVES; 2 hours a week, second half-year.

BY ASSISTANT PROFESSOR TABER.

Introductory courses (of Group B):

ANALYTIC GEOMETRY OF CONIC SECTIONS, QUADRIC SURFACES, AND HIGHER PLANE CURVES; 2 hours a week, through the year.

ORDINARY DIFFERENTIAL EQUATIONS,* CALCULUS OF VARIATIONS, AND ELLIPTIC FUNCTIONS; 3 hours a week, through the year.

SEMINARY in connection with these introductory courses; through the year.

BY M. DE PEROTT.

Introductory course (of Group B):

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATIONS TO THE THEORY OF EQUATIONS; 2 hours a week, first half-year.

Advanced course:

THEORY OF NUMBERS; 2 hours a week, second half-year.

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*The course on PARTIAL DIFFERENTIAL EQUATIONS (which together with the above constitutes the complete course on differential equations) will be given by Dr. Webster. See announcement of the Physical Department. Course 7.

During the academic years 1889-95, advanced and special courses have been given in :

1. The History of Arithmetic and Algebra among various peoples from the earliest times to A. D. 1650.
2. Theory of Numbers.
3. Linear Transformations and Algebraic Invariants, with applications to algebraic equations and geometry.
4. Theory of Substitutions, with applications to algebraic equations.
5. Plane Analytic Geometry.
6. Solid Analytic Geometry.
7. Hyperspace and Noneuclidean Geometry.
8. Enumerative Geometry.
9. Quaternions, with applications to geometry and mechanics.
10. Multiple Algebra, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. Modern Synthetic Geometry.
12. Theory of Functions according to Cauchy, Riemann, and Weierstrass, with applications.
13. Weierstrass' Theory of Elliptic Functions.
14. Abelian Functions and Integrals.
15. Numerical Computations.
16. Theory of Quadratic Forms.
17. Analysis Situs, particularly the connectedness of surfaces and map-coloring.
18. Surfaces of the Third and Fourth Orders (analytically treated).
19. Plane Curves of the Third and Fourth Orders (analytically treated).
20. Klein's Icosahedron-Theory.
21. Elliptic Modular Functions.
22. Theta-Functions of Three and Four Variables.
23. Riemann's Theory of Hyperelliptic Integrals.
24. Symbolic Logic.
25. Twisted Curves and Developable Surfaces (torses).

26. Rational and Uniform Transformations of Curves and Surfaces.

27. Theory of Functions of a Real Variable.

28. Definite Integrals and Fourier's Series.

29. Ordinary Differential Equations, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss', Legendre's and Bessel's functions.

30. Partial Differential Equations, including La Place's and Lamé's functions.

31. Finite Differences and Probabilities.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors ; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate considera-

tion, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented memoirs embodying the results of original investigations that receive the approval of the head of the department, and have passed creditable examinations in their principal department of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University. Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

MATERIAL FACILITIES.

The library is provided with the more important textbooks, treatises, and memoirs on the various branches

of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals of which the library has complete or nearly complete sets are the following:

Abhandlungen der Math.-Phys. Classe der Königl. Sächsischen Gesellschaft der Wissenschaften. Vols. 1-14. Leipzig, 1852-88.

Comptes Rendus. Hebdomadaire des Séances de l'Académie des Sciences. Vols. 1-120 with 3 registers. Paris, 1835-95.

Mathematische und Naturwissenschaftliche Mittheilungen aus den Sitzungsb. d. Königl. Preussischen Akad. der Wissen. zu Berlin. 1892-95.

Nachrichten von der Georg-Augusts-Universität und der Königl. Gesellschaft der Wissenschaften zu Göttingen. 1853-88.

The Philosophical Magazine and Journal of Science (London, Edinburgh and Dublin). 1798-1895.

Transactions of the Philosophical Society of Cambridge. 1822-94. 15 vols.

Philosophical Transactions of the Royal Society. London, 1665-1887. 179 vols. (Continuations in Green Library).

Proceedings of the Cambridge Philosophical Society. Vols. 1-8. 1843-94.

Proceedings of the Royal Society of London. Vols. 1-57. 1800-95.

Acta Mathematica. Vols. 1-19. Stockholm, Berlin and Paris. 1882-95.

American Journal of Mathematics. Vols. 1-17, with index to vols. 1-10. Baltimore, 1878-95.

Annales scientifiques de l'Ecole Normale Supérieure. Series I, vols. 1-7; series II, vols. 1-12; series III, vols. 1-12. Paris, 1864-95.

Bulletin des Sciences Mathématiques (Darboux, etc.). Series I, vols. 1-11; series II, vols. 1-19. 1870-95. Paris,

Bulletin de la Société Mathématique de France. Vols. 1-23. Paris, 1873-95.

Jahrbuch über die Fortschritte der Mathematik. Vols. 1-24. Berlin, 1868-95.

Journal de l'Ecole Polytechnique, etc. Nos. 1-64. Paris, 1794-1894 (in 93 vols.).

Journal de Mathématiques, pures et appliquées, etc. (Liouville.) Series I, vols. 1-20; series II, vols. 1-19; series III, vols. 1-10; series IV, vols. 1-10; series V, vol. 1. Paris, 1836-95, with register to series I, vols. 1-15.

Journal für reine und angewandte Mathematik (Crelle, etc.). Vols. 1-114, with register to vols. 1-100. Berlin, 1826-95.

Mathematische Annalen (Clebsch, etc.). Vols. 1-45. Leipzig, 1869-95.

The Oxford, Cambridge and Dublin Messenger of Mathematics. Series I, vols. 1-5; series II, vols. 1-19. London and Cambridge, 1862-90.

Nouvelles Annales de Mathématiques. Series I, vols. 1-20; series II, vols. 1-20; series III, vols. 1-10. Paris, 1842-91.

Proceedings of the London Mathematical Society. Vols. 1-19, London, 1865-88.

Quarterly Journal of Mathematics, pure and applied. Vols. 1-27. London, 1857-95.

Zeitschrift für Mathematik und Physik (Schlömilch, etc.). Vols. 34-40. Leipzig, 1888-95.

The University possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björling's thread-models of developable surfaces.

The department possesses also:

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II.

PHYSICS.

This department is under the direction of Assistant Professor Arthur G. Webster, Ph. D., who will regularly deliver, with a period of two years, the following cycle of courses :

1. Dynamics.—General Methods, Canonical Equations, Systems of Particles, Rigid Bodies.
2. Newtonian and Logarithmic Potential Function. Attraction of Ellipsoids.
3. Elasticity, Hydrodynamics, Oscillatory and Wave Motion, Dynamical Basis of Sound and Light.
4. Electricity and Magnetism.
5. Optics, Physical and Geometrical.—Elastic and Electromagnetic Wave-theories.
6. Thermodynamics, Thermo- and Electro-Chemistry, Kinetic Theory of Gases.
7. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical Conduction, Equation of Wave Motion, Telegrapher's Equation, Developments in Series, Legendre's, Laplace's, Bessel's, and Lamé's Functions.

The courses for the year 1895-6 will be 5, 6 and 7.

In addition to the above courses, there will be held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation of summaries of important articles appear-

ing in the journals. Besides the above regular courses, advanced courses will, from time to time, be given on such subjects as the Figure of the Earth, Theory of Tides, and Theory of Sound.

The aim of the department is to ensure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research, he will at all times have the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him

with those general methods that appear in the various branches, and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance, may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat, the steady flow of electricity, certain cases in hydrodynamics and sound, or in the theory of magnetic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal, distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "spin," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy, and it is attempted, so far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper

mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the Calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable text-books for preparation, may be recommended to the student Greenhill's, Williamson's, or Byerly's Differential and Integral Calculus, C. Smith's Analytic Geometries, and Hanus' Determinants.

Requirements for the Doctor's Degree.

1. The ability to read at sight specimens of scientific French and German, tested six months before the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics, and upon the subjects named above in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfillment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged

to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore, it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

Facilities.

The rooms of the Physical Department are on the basement and first floors, and are large and well lighted. On the lower floor or basement are three rooms for work requiring steadiness and freedom from vibration. The first, A, contains the cathetometer made by the Société Genèvoise, securely fastened to the wall; Dr. Webster's drop chronograph, and the standard condenser and other apparatus used in determining "*v*."

The second room is divided by a partition into two, B and D, each containing heavy piers, D being a room designed for optical work, or for work requiring a steady temperature. In it are at present placed the fine Foucault revolving mirror, constructed by Brashear, used in the determination of the velocity of electric waves in wires, with the motor and blower used in driving it, and the governor to the high-speed chronograph, which latter stands on a pier in room B. In room B are two piers standing in front of the windows, and designed for spectroscopic work. The room C contains the astronomical clock and balances, and is also used for electrical work. The room E is fitted up as a general workshop, and

contains a lathe, planer, machinist's bench and tools. This room communicates with the large room G, in which are placed the engine, dynamo, and other machinery. The further end is used as a carpenter shop for pattern-making, etc. H is the battery room, containing forty cells of storage battery, and K is the general boiler room.

On the floor above are three rooms, the first, over A, being at present used for optical work. The next room contains cases for the apparatus when not in use, together with a store-room at one end. The third room is the lecture room, and is adorned with Rowland's great spectrum map. Special mention should be made of the work-shop, which has proved invaluable to the success of the work done in the laboratory. The shop is well fitted up with tools, power being supplied from a ten-horse power Armington & Sims engine with independent boiler, which drives the Edison dynamo, Reed engine lathe, five-foot planer, grindstone and emery-wheels. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided.

The Library.

Among the most important of the facilities of any department is of course to be named the library, and among the first questions naturally asked may be expected those relating to the accessibility of books to students and the conditions regarding their use. The University Library is open from 8 A. M. to 6 P. M., and any number of books may be taken out by any person, and kept three weeks. Books on any particular subject may be reserved by an instructor, and may be then taken out only over night. Free access to the shelves is granted, so that the maximum usefulness may be had from the books. The books are arranged on the shelves by sub-

jects, corresponding with a card catalogue, so that a glance will show whether a book is in its place.

The library of the Physical Department, though small, is carefully selected, and while the number of volumes might be doubled with advantage, their usefulness would hardly be increased in the same ratio. In mathematical physics particularly, the library may be fairly said to contain the best works. Among others may perhaps be mentioned:

Collected Writings of Helmholtz, Kirchhoff, Thomson, Green, Joule, Stokes, Gauss, Fourier, Laplace.

Potential, Electricity and Magnetism. — Riemann, Betti, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Mascart and Joubert, Watson and Burbury, Gray.

Elasticity.—Mathieu, Ibbetson, Love, Todhunter and Pearson, Clebsch, Neumann, Lamé, Boussinesq, Résal.

Hydrodynamics.—Bassett, Lamb, Kirchhoff, Neumann.

Light.—Mascart, Kirchhoff, Neumann, Volkman, Résal, Bassett, Preston.

Heat.—Clausius, Rühlman, Bertrand, Zeuner, Poincaré.

Sound.—Rayleigh, Donkin.

A large number of treatises on Mechanics and a set of the Mémoires et Travaux du Comité International de Poids et Mesures may be also mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.
Zeitschrift für Instrumentenkunde.
Comptes Rendus.
Philosophical Transactions.
Proceedings Royal Society.
Philosophical Magazine.
Nature.

The library subscribes to the following journals:

American Journal of Science.
Philosophical Magazine.
Proceedings Royal Society.

Electrician.
Electrical World.
Nature.
Annalen der Physik u. Chemie.
Beiblätter do.
Zeitschrift für Instrumentenkunde.
Annales de Chimie et de Physique.
Journal de Physique.
Comptes Rendus.

III.

CHEMISTRY.

No courses will be offered in this department during the year 1895-96.

IV.

BIOLOGY.

Programme of Work for Year 1895-96.

Dr. Hodge will offer the following courses:

I. General Biology.—This course is intended to give in general outline the fundamental principles of biological science. The most general classification of plants and animals will be given, with description of structural and physiological characteristics, through a series of typical organisms. The topics: *Methods and aims of biological research, origin of living matter, organization, growth* and *reproduction, heredity, differentiation* and *evolution* will be given special prominence throughout the course. One lecture weekly, October to January. Laboratory work will be arranged to suit the requirements of those taking the course.

II. Comparative Study of Nervous Systems and Sense Organs.—The point of view of this course will be both anatomical and physiological. It is intended to begin with a study, as far as possible comparative, of the structural elements of the nervous system in both invertebrates and vertebrates. Following this, it is proposed to consider the structure and functions of the nervous system in a series of animals, beginning with the cœlenterata and ascending through the mollusca, vermes, tunicata, arthropoda and vertebrates. The course will be illustrated, so far as possible, by diagrams, models, dissections and experiments. One lecture weekly, January to June.

It is desired in connection with the above courses to hold a biological seminary, which shall meet one evening weekly

throughout the year. During the past year the topic for consideration has been recent literature in the field of evolution. For 1895-96 it is proposed to devote a large part of the time to a study of the history, methods of research and development of neurology. The work will consist of citations from standard medical history, reference to original sources, preparation of papers upon special topics and informal discussion.

PHYSIOLOGY AND NEUROLOGY.

It is intended to arrange physiological courses in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work.

The general subject will include lectures, reading courses, demonstrations and laboratory work in the following lines:

1. Muscle and nerve.
2. Nutrition, including digestion, blood and lymph, circulation and respiration, and excretion.
3. Brain.
4. Skin and sense organs.
5. Reproduction.

During the work in each of these divisions, the microscopical structure of the organs concerned as well as the physiological chemistry connected with their action, will receive special attention.

Courses in Physiology for the year 1895–96 will be offered as follows:

III. Muscle and Nerve Physiology.—This course will include reflex action. It will extend from October to January, with lectures, demonstrations, and laboratory work arranged to meet the requirements of students taking the course.

IV. Anatomy and Physiology of the Skin and Sense Organs.—One lecture weekly, with demonstrations, February and March.

By way of supplementing the above courses and courses in other departments of the University, two courses have been planned as follows :

V. Embryology and Growth of the Human Brain and Sense Organs.—Six lectures, with demonstrations and literature.

VI. Practical Histology of the Nervous System.—The course will be purely a laboratory course, with such lectures, directions and conferences as may be required by those taking it. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course II, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

Experimental Work.

Laboratory work in both physiology and neurology is arranged to meet the needs of individual students. Its general purpose is to faciliate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types are at the disposal of the laboratory, and where new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. A workshop supplied with lathe and good equipment of tools for working both wood and metal is attached to the laboratory, and with these facilities minor pieces of apparatus may be well made or old apparatus altered to suit the demands of new problems. The aim of the

laboratory is thus to place at the disposal of men interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case a man has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems, from which he may select a subject suited to his tastes and attainments. A course in biology, such as is given in our best colleges and state universities, is sufficient to enable students to begin work here.

The library of the department has been selected with two important considerations in view. The first of these has been to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible, both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahrsberichte and Centralblätter greatly facilitates the work of referring to the literature of topics under investigation in the laboratory.

Journal Club. It is intended to hold weekly journal club meetings, for the purpose of reporting and discussing important articles in the current periodicals.

BIOLOGICAL JOURNALS.

Anatomischer Anzeiger.
Annual of the Universal Medical Sciences.
Biologisches Centralblatt.
Brain, 1878 (complete in medical library).
Centralblatt für Nervenheilkunde und Psychiatrie.

Centralblatt für Physiologie.
Index Medicus. *Complete*, with Index Catalogue of the Library of the Surgeon-General's Office.
Jahresberichte über die Fortschritte der Anatomie und Physiologie, 1873-1895, complete.
Jahresberichte über die Fortschritte der reinen Pharmacetischen und Technischen Chemie, etc., 1847-1887, complete.
Jahresberichte über die Leistungen und Fortschritte in der Gesammten Medicin, Virchow and Hirsch.
Royal Society Catalogue of Scientific Papers, A-Z.

To the above may be added the four following taken by the Green Library, and accessible to students, viz.:

Centralblatt für die Medicinischen Wissenschaften, complete.
Morphologisches Jahrbuch, complete.
Monatsschrift, International für Anatomie und Histologie.
Schmit's Jahrbücher der in-und ausländischen gesammten Medicin.

Abhandlungen der math.-phys. Cl. d. k. b. Akad, der Wissenschaften zu München, 1860.
Abhandlungen der math.-phys. Cl. der k. sächsischen. Gesellschaft der Wissenschaften. Leipzig, 1852-88.
American Journal of Science.
American Naturalist, 1888-95
Alienist and Neurologist, 1890-95.
Annales de l'Institut Pasteur. Vols. 3-5.
Arbeiten a. d. physiologischen Institut Tübingen.
Archiv für Anatomie und Physiologie, 1796, complete to 1895.
Archiv für Anatomie und Entwickelungsschichte, His and Braune, complete.
Archiv für pathologische Anatomie und Physiologie und für Klinische Medicin, Virchow, complete, 1847-95.
Archiv für Ophthalmologie, Leipzig, 1889 (Green Library).
Archiv für Psychiatrie und Nervenkrankheiten, Berlin, 1889-95.

Archiv für Mikroskopische Anatomie. (Complete set in Green Library.)
Archives de Biologie, 1889-95.
Archives Italiennes de Biologie, 1889-95. (Complete set in Green Library.)
Archives de Neurologie, 1890-95.
Archives de Physiologie Normale et Pathologique, 1889-95.
Archives de Zoologie Expérimentale et Générale.
Beiträge zur Anatomie und Physiologie von Eckhard, 1858-88.
Beiträge zur Pathologischen Anatomie und zur Allgemeinen Pathologie, Ziegler, 1886-95.
Berichte über die Leistungen in der Naturgeschichte der Niederen Thiere, 1848-53, 57-60, 61-65, 66-69, 70-71, 72-75, 76-79.
Bibliotheca Zoologica; Taschenberg Lieferungen. 1886-95.
Claus Arbeiten aus dem zoologischen Institut der Universität Wien und der zoologischen Station in Trieste, 1878-95.
Deutsche Zeitschrift für Nervenheilkunde, 1891-95.
Internationale Monatsschrift für Anatomie und Physiologie, 1889-95.
Johns Hopkins Hospital Bulletins, 1890-95.
Journal de l'Anatomie et de la Physiologie, 1889-95.
Journal of the Coll. of Science, Imperial University of Japan, to date.
Journal of the Marine Biological Association of the United Kingdom. Vols. I-III.
Journal of Comparative Neurology, 1891-95.
Journal of Morphology, 1889-95.
Journal of Nervous and Mental Disease, 1890-95.
Journal of Physiology. Vols. X-XVII.
Journal of the Royal Microscopical Society, 1878-95.
Laboratoire d'Histologie du Collège de France, Années 1874-83-88.
Mathematische und Naturwissenschaftliche Mittheilungen aus den Sitzungsb. d. k. p., Ak. d. Wissen zu Berlin, 1882-93.
Mind, 1876-95.
Mittheilungen aus der Zoologischen Station zu Neapel, complete, 1879-95.

Nature, 1869-95.
Frorïep, Notizen, 1822-36, in 50 parts; 1837-46, in 40 parts.
Pflüger's Archiv. für die Gesammte Physiologie, complete, 1868-95.
Philosophical Society of Cambridge Transactions, 1822-95, complete.
Philosophical Transactions of the Royal Society, London, 1665-1887, complete with indexes. (1887-95 in Green Library.)
Popular Science Monthly, 1872-95.
Proceedings of the Cambridge Philosophical Society, 1843-95.
Proceedings of the Royal Society of London, 1800-95.
Quarterly Journal of Microscopical Science, 1889-93.
Ray Society Publications.
Report of the Exploring Voyage of H. M. S. Challenger.
Revue Scientifique, 1889-95.
Revue des Sciences Médicales en France et à l'Etranger, Hayem, 1889-95.
Revue de Médicine. Vols. IX-XV.
Studies from the Biological Laboratory, Johns Hopkins University (complete in Green Library).
Studies from the Laboratory of Physiological Chemistry, Sheffield Scientific School, Yale University, 1884-95.
Verhandlungen der physiologischen Gesellschaft zu Berlin, 1886-95.
Zeitschrift für Biologie, 1889-95.
Zeitschrift für Allgemeine Psychiatrie und psychisch-gesichtliche-Medicin, 1888-95.
Zeitschrift für Psychologie und Physiologie der Sinnesorgane. Vols. I-VIII (1895), complete.
Ziemssen's Handbuch der Speciellen Pathologie und Therapie. Vols. I-XVII.
Zoölogical Record, 1864-95.
Zeitschrift für wissenschastliche Mikroskopie, 1889-95.

In addition to the above, current numbers of many purely medical journals are taken by the library. Among these may be mentioned: American Annals of

the Deaf, American Journal of Insanity, Archives Pediatrics, Brooklyn Medical Journal, Canadian Practitioner, The Chicago Journal, Medical Record, Medical Times, New York Medical Journal, Pacific Medical Journal, Therapeutic Gazette, The Practitioner, The Satellite, and others.

A number of important journals not mentioned in the above list are taken by either the Worcester Co. Medical Library or the Worcester Public Library, and by the courtesy of these libraries are readily accessible.

V.

PSYCHOLOGY.

A complete course in Psychology at Clark University includes the following subjects :—

I. Anatomy and physiology of the brain and spinal cord; senses; and other parts of the body, especially the muscles; the organs of the will, so far as they affect psychological powers and processes. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and experimental psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-Time, Memory and Attention. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Abnormal and morbid psychology, as nature's experiments, *e. g.*, Border-line phenomena as seen in neurotic people, prodigies and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's clinic and lectures below.

IV. Anthropological psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive Art, and the study of the life of savages and children; Adolescence and senescence; Physical measurements

illustrating laws of growth in size and power, etc. See Dr. Chamberlain's laboratory and courses.

V. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VI. History of psychology and philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally.

VII. Applications of psychology; pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sexual problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do in two or three years.

The PSYCHOLOGICAL LABORATORY consists of a suite of four rooms on the second floor of the main building, one large and three small. The large room on the second floor is used as a general laboratory and instrument room; of the small rooms, one is used as a room for chronometric experiments, the second as the office of Dr. Sanford, and the third as occasion requires. A large room on the third floor is also used for auditory experiments requiring freedom from ordinary noise, and for storing some pieces of bulky apparatus.

The department is well supplied with apparatus both for demonstration and research, and has access also to the collections of the physical and biological departments. The collection is especially strong in apparatus for the study of the senses and for psychological time-measurements. Many pieces have been manufactured

at the University and a considerable number designed here for special researches. In addition to the more ordinary pieces the following may be mentioned:

Kinesimeter of Hall and Donaldson. Apparatus for the study of "facial vision." Tilt-board after Aubert for testing sense of position of the body as a whole. Rotation-table after Aubert for study of sense of rotation. Great Rotation-apparatus of Mach. Krohn and Bolton Touch-apparatus. Thermæsthesiometer of Scripture. Algometers (2). Balance for gradual changes of pressure after Hall and Motora. Olfactometer after Zwaademaker. Ellis' Harmonical for illustrating Helmholtz's "Sensations of Tone," with standard forks. Set of König forks on resonance boxes. Set of König resonators. König wave-siren disk. Sturtevant blower. Difference-tone whistles. Various small tuning-forks specially tuned. Chromatoskiameter after Holmgren. Hering's horizontal rotation color-mixer (and several others), with large set of disks. Phenophthalmotrope after Donders, and other eye models. Ophthalmometer. Visual-test apparatus in considerable variety. Phacometer after Snellen. Apparatus for Ragona Scina's Experiment, with diagrams. Apparatus for Zöllner's illusion, with moving diagrams. Pseudoscope. Wheatstone Stereoscope (convertible into Telestereoscope) with many diagrams. Horopterscope after Donders. Antirrheoscope after Hall and Bowditch. Apparatus for Rinsing Illusion after Hall and Bowditch. Hering's apparatus for Simultaneous Contrast, two forms. Hering's "Shader." Masks for the conversion of relief. Diagrams of standard optical illusions. Binocular Stroboscope. Hipp Chronoscope, with regulating and other subsidiary apparatus in considerable variety. Large pendulum regulator, devised at Clark. High-speed Chronograph after Wundt. Pendulum Chronograph, devised at Clark. Fall Chronometer after Cattell. Eastman Personal Equation Machine. Pendulum for Complication Experiments after Wundt. Time-sense apparatus after Wundt. Apparatus for study of least observable inter-

val between stimuli addressed to the same and to disparate senses, devised at Clark, two forms. Ludwig Kymograph. Continuous-paper Kymograph. Neuromœbimeter after Bowditch. Bowditch Slow-motion Pendulum. Metronomes and special pendulums in variety. Time-markers and signals in several forms. Electric forks and vibrators from 4 to 500 per sec. Induction coil for sparks. Sliding induction coils (4). Electric motors, several of small size. *Augenmass-apparat*, three pieces. Artificial star apparatus for classification of stars according to magnitudes, two forms. Pressure-balance after Jastrow. Mosso's Balanced-bed. Laryngoscope and Grüber's Speculæ. Various anthropometric apparatus after Galton.

The collection of apparatus is constantly increasing by purchase or construction, especially of apparatus for particular researches. For such apparatus the major part of the annual appropriation of the department is expended.

The Psychological Library is fullest on the topics of EXPERIMENTAL AND PHYSIOLOGICAL PSYCHOLOGY, and especially on their current literature. The collection on Criminology and related topics is also full. The following journals are on file at the University :

Vierteljahrsschrift für wissenschaftliche Philosophie. International Journal of Ethics. The Monist. Zeitschrift für Psychologie und Physiologie der Sinnesorgane. Annali di Nevrologia. Philosophical Review. Journal of Speculative Philosophy. Mind. American Journal of Psychology. Archivio di Psichiatria, Scienze Penali ed Antropologia Criminale. Revue Philosophique. Philosophisches Jahrbuch. Philosophische Monatshefte. Allgemeine Zeitschrift für Psychiatrie. Annales Médico-Psychologiques. Philosophische Studien. American Journal of Insanity. Quarterly Journal of Inebriety. Journal of Nervous and Mental Disease. Archives de Neurologie. Journal of Comparative Neurology.

Rivista Sperimentale di Freniatria e di Medicina Legale. Sphinx. The Psychological Review. Proceedings of the Society for Psychical Research. Journal of the Society for Psychical Research. Centralblatt für Nervenheilkunde und Psychiatrie. Neurologisches Centralblatt. Alienist and Neurologist. American Annals of the Deaf. Archiv für systematische Philosophie. Journal of Mental Science. Medico-legal Journal. Rivista Critica di Filosofia scientifica. Brain.

Besides these and a large number of medical and other scientific periodicals, the following physiological journals, which frequently contain psychological articles of the first importance, are at hand: Archives de Physiologie. Archiv für Physiologie (Du Bois-Reymond). Archiv für die gesammte Physiologie (Pflüger). Centralblatt für Physiologie. Journal of Physiology. Biologisches Centralblatt. In the Public Library of the city, to which students have easy access, are also the Archiv für Ophthalmologie and the Archiv für Psychiatrie und Nervenkrankheiten.

During the academic year 1895-96 the following courses will be given :—

DR. G. STANLEY HALL'S COURSES.

A. HISTORY OF PSYCHOLOGY AND PHILOSOPHY from the beginning of the philosophic period to the present. This course will include medical, scientific and educational theories, and a discussion of contemporary writers. The efficient coöperation of Mr. S. S. Green, librarian of the Public Library, has been very helpful to this course during the past years, and is assured for the future. This course is divided into the following sub-courses or topics :

I. Early oriental philosophic thought.

II. The Greek philosophy, with special attention to Plato, Aristotle, Stoics and Epicureans.

III. Conceptions and ideals of early Christianity.

IV. Patristic philosophy.

V. Scholasticism.

VI. The early mystics.

Four hours weekly throughout the year.

B. Systematic Psychology. This course will involve discussions and conclusions from the lecturer's point of view concerning the leading topics of modern psychology in the larger sense of that term, experimental, normal, morbid, criminological and genetic, or from the standpoint of child study. One or two hours weekly throughout the year.

C. The Saturday morning lecture on "Education" will be devoted to the leading topics of interest in the field.

D. Conferences will be held in the President's library Monday evenings, as during the present year, for reading, discussion, etc. One three-hour session weekly.

E. Students' Lecture Courses. All students in the *Psychological Department* are expected to give one or more lectures, open to members of the University, upon topics to which they have given chief attention during the year. These courses have been both valuable and attractive.

F. A series of Saturday afternoon clinics will probably be held at the Hospital for the Insane, and excursions may be made as heretofore to charitable and educational institutions.

All students in this and the Educational Department are expected to select early in the year, after conference with instructors, who will suggest and advise, some topics of research upon which special work shall be done during the year, with a view to obtaining results to be submitted for publication by the end of June.

Dr. Sanford's Courses.

A. Psychological Practicum.—Laboratory Practice and Informal Lectures on Methods, Apparatus, and Results.

During the first half year this course will consist of selected experiments on various experimental topics, those on the senses being selected from Dr. Sanford's "Course in Experi-

mental Psychology." The aim is to familiarize the student with the most important types of experimentation, and to give him a certain facility in handling standard pieces of apparatus. During the second half year the student will be assigned a problem for experimental solution under competent direction. The scope of the problems is roughly indicated by the Minor Studies published in Vols. V and VI of the *American Journal of Psychology*. Four to five hours a week throughout the year.

B. LECTURES.—Several short courses of lectures on psychological topics of special interest. These lectures will include the following among others: Images and Imagination; Experimental Æsthetics and Experiments on the Feelings; Relations of Respiration and Circulation to Psychical Activity; The Phenomena of Sleep and Waking.

C. ORIGINAL RESEARCH.—Advanced students are directed in their work by Dr. Sanford in coöperation with Dr. Hall and Dr. Burnham. The laboratories are open for advanced work at times to suit the convenience of those engaged in it.

ANTHROPOLOGY.

Dr. Chamberlain will lecture twice a week throughout the year. The following courses will be taken up:

A. GENERAL, embracing: (a) HISTORY, scope and relations of the science of Anthropology. (b) PHYSICAL ANTHROPOLOGY. Problems, investigations, results, laboratory work. (c) ETHNOGRAPHY. Races and race-origins. (d) ETHNOLOGY, including sociology; origin and development of the arts and sciences; mythology; folk-lore; religions. (e) LINGUISTICS. Race and language. Origin and development of language and of languages. Psychology of language. Gesture-speech and written language. Comparative linguistics. Comparative literature. (f) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY. Ethnic morals. (g) HISTORICAL AND ARCHÆOLOGICAL. Primitive man and primitive culture.

B. Special briefer courses, embracing, among others, the following special subjects: The Child among Primitive People; Sex in Anthropology; Anthropometry of Children and Youth; The Emotions and their Expression among Primitive Races; The Treatment of the Physically and Mentally Weak among the less Civilized Races of Men; Crime in the Lower Races; The Idea of the Soul Among Primitive Peoples; The Philosophy of American Indian Mythologies; The Psychology of Primitive Languages; The Family, its Origin and Development.

The lectures in anthropology will have special bearing upon the courses in psychology and pedagogy in the University, as may be seen from the outline given above.

From time to time reviews of the most important current literature will be made and students acquainted with the best contributions to anthropological science in the various foreign languages.

VI.

EDUCATION.

This has been made a sub-department, and now offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest con nection with the work in psychology and anthropology, and in part based on these. The work in this department is intended to meet the needs of the following classes of men:

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Educational Department includes courses upon the following subjects:—

I. (a) Child-Study. (b) Educational Psychology. (c) School Hygiene.

II. (a) Principles of Education. (b) History of Education and Reforms. (c) Methods, Devices, Apparatus, etc.

III. (a) Organization of Schools in Different Countries. (b) Typical Schools and Special Foundations.

(c) Motor Education, including manual training, physical education, etc. (d) Moral Education. (e) Ideals.

IV. Higher Education, including university work, technical education; training in law, medicine, and theology; recent progress, present state and prospects of the most advanced education in different countries, including our own.

The courses in Education for 1895-96 will be as follows:—

Dr. G. Stanley Hall's Course.

The leading present topics in Education. One hour weekly throughout the year.

Dr. Burnham's Courses.

A. School Hygiene.—The fundamental principles of hygiene in regard to school buildings, heating and ventilation, lighting, school furniture, playgrounds, etc. Mental hygiene and the hygiene of instruction. The laws of nervous activity in relation to problems of instruction. Fatigue. The period of study. The hygiene of the kindergarten. The hygiene of reading, writing, arithmetic, manual training, etc. Scientific tests of mental and physical ability. School diseases, defects of sight, hearing, etc. One hour a week throughout the year.

B. Present Problems in Education in this country and in Europe. Recent reforms. Educational experiments. The education of girls. The problems of supervision and administration. One hour a week, half a year.

C. History of Methods, Administration, and Discipline.—The study of methods from the point of view of psychology and hygiene. The psychology of discipline. Teaching as a profession. The relation of the teacher to the community, etc. One hour a week, half a year.

The work of the *Seminary*, once a week throughout the year, will be, for the most part, adapted to individual students. It is hoped that each student will select, after conference with President Hall and Dr. Burnham, a topic for

special investigation. The results of such studies may be published.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. *Cyclopædias and Books of Reference.*
2. *General Historical Works.*
3. *Histories of Special Instutions.*
4. *General Surveys* and Reports on the Preset Condition of Education.
5. *Standard Writers* on Education and *Biographies.*
6. *Educational Psychology.*
7. *General Works on the Theory of Education.*
8. *Methods in Special Subjects* (Reading, Arithmetic, Geography, History, Music, and the like).
9. *Physical Education and School Hygiene.*
10. *The Study of Children, the Kindergarten*, etc.
11. *The State and Laws*, Civic Education, Administration and School Organization.
12. *Industrial and Technical Education.*
13. *Miscellaneous.*
14. *School Calendars*, etc.; Annual Reports, Programmes, and the like (mostly foreign).
15. *Education of Defectives.*
16. *Art Education*, including Museums, etc.
17. *The Training of Teachers;* Examinations, etc.

18. *Moral Education* and School Discipline.
19. *University Education.*
20. *The Learned Professions.*
21. *Special Topics.*
22. *Special Reports of the Bureau of Education.*
23. *Miscellaneous Pamphlets.*
24. *Periodicals.*
25. *Miscellaneous Reports*; a, American; b, English; c, French; d, German; etc.
26. *Text-books;* a, Mathematics; b, Science; c, Drawing; etc.; d, Reading and Writing; e, Language and Literature; f, Geography; g, Music; h, Miscellaneous; i, History.
27. *Old Text-books*, with same sub-divisions as above.
28. *State and City Reports*, sub-divided by states.
29. *Charts, Maps, Pictures,* etc.
30. *Religious Education.*

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

LIBRARY.

The University Library now contains 16,000 bound volumes and 1,500 pamphlets, and the reading room receives 239 journals. With the exception of 3,500 Congressional publications and other contributed volumes, the library and the journals represent chiefly the five departments.

The books are grouped as follows :—

A Works of General Reference.
B Journals.
C Mathematics.
D Physics.
E Chemistry.
F Zoölogy.
G Physiology.
H Pathology.
I Psychology.
J Philosophy.
K Ethics.
L Criminology.
M Anthropology.
N Education.
O Botany.

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their room, case, tier and shelf. They comprise in addition to Congressional publications, bound files of magazines, several score of rare old books, a collection of art publications, travels, complete works, sets of reports, histories, biographies, etc.

The library of the University at present consists of six rooms : I. The large general room, containing A,

B, C, D, F, G, H, I, J, K, L, M, and O. II. The journal room. This contains chiefly current numbers of journals and books of reference. The journals are arranged on broad shelves on each side of the room for ready inspection. III. The educational room. This contains all the educational works except state and city reports and college publications, which have a place and a catalogue by themselves. IV. Chemical Library room, containing both the books and periodicals in that department and labeled E. V. A small store room for books not yet placed on the shelves or catalogued. VI. A small room for duplicates, unbound copies of journals, etc. Besides the subject classification, books are arranged in cases, tiers, shelves, etc.

All the privileges of the library are open to all appointees of the University alike.

The library is open from 8 A. M. to 6 P. M., and each member of the University has direct access to every book and journal.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 100,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing about 360 periodicals and 100,000 volumes, has supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

A Medical Library of 8,000 volumes is also accessible.

By the courtesy of the Librarian of Harvard University and of the Surgeon General at Washington, books from the libraries under their charge are sent to the Uni-

versity for a limited time; and by the courtesy of S. S. Green of the Worcester Public Library, all the resources of that institution and its facilities for borrowing from distant libraries are available to all members of the University.

LIBRARY RULES.

1. No loud talk is allowed in any part of the library or reading room.

2. Every book shall be returned at the end of ten days from the time at which it was taken out; at this time it may be renewed for ten days, unless wanted.

3. Any book may be called in at three days' notice at the discretion of the Secretary of the Library Committee.

4. Any member of the staff may reserve from circulation such books as he deems necessary in connection with the courses given in his department; and these shall be placed by themselves and marked "reserved."

5. Current numbers of periodicals shall not be taken out until they have been in the library two weeks.

6. Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out on Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

7. All dictionaries, cyclopædias and books of general reference are permanently reserved.

8. Books of great value may be taken out only by special permission.

BY-LAWS.

The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University, and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

As the efficiency of the University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction, shall be his most important duty. If at any

time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

The President of the University shall be the medium of communication between the Trustees and instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

The President shall call and preside over all official meetings of the instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned, and they shall be notified or removed by him, subject to the approval of the Finance Committee.

No instructor shall order any books or apparatus, or anything connected with the work of instruction, without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or re-

pairs within and upon the same, shall be made without the approval of the Board of Trustees or Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

Each instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and coöperation, and shall encourage research by precept, and, if possible, by example.

The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee or the President.

These By-Laws, or any one of them, may be changed, amended or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified and held for that purpose.

REGULATIONS.

1. All requisitions for apparatus and books must be made through the University office upon printed blanks

provided for that purpose, and, except in the case of docents, signed by a member of the staff.

2. So far as possible orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. A book shall be kept for each department containing a complete list of apparatus and supplies, with itemized cost. With the aid of this book a complete inventory of the stock shall be made once a year, and whenever else the President shall direct.

4. Requisitions for repairs, furniture, plumbing and work about the buildings must be made in writing and with detail, and must be approved by the Building or Finance Committee, or such person or persons as they may authorize. When once thus passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

5. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

6. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

7. The Trustees desire that no instructor, docent or fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

The following additional rules were passed by the Board of Trustees, at a meeting held April 4th, 1891, to take effect for the next academic year:

8. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department, and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

9. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

10. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the University office.

PUBLICATIONS CONNECTED WITH THE UNIVERSITY.

I. The First Official Announcement, May 23, 1889.

II. The Addresses and Exercises at the opening of the University on October 2nd, 1889.

III. Register and Second Official Announcement, May, 1890.

IV. First Annual Report of the President to the Board of Trustees, October 4, 1890. This contains the first statement of the plan, aims and methods of the University, and reports upon the original investigation of each department from each member who has made such.

V. Register and Third Official Announcement, April, 1891.

VI. Second Annual Report of the President to the Board of Trustees, September 29, 1891.

VII. Register and Fourth Official Announcement, April, 1892.

VIII. Third Annual Report of the President to the Board of Trustees, April, 1893. Contains a full report of the work done in each department since the opening of the University; pp. 168.

IX. Register and Fifth Official Announcement, May, 1893.

X. Programme of the work of the Summer School at Clark University (July 16 to 28, 1894).

XI. Register and Sixth Official Announcement, May, 1894.

XII. Summer School Programme (July 15 to 27, 1895).

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS.

The American Journal of Psychology. This *Journal* was commenced in November, 1887, and is edited by G. Stanley Hall. Each volume contains four numbers of over 150 pages each. Besides original articles, about half its space is devoted to careful digests of the important literature in its field. Price, $5 per volume; single numbers, $1.50. J. H. Orpha, publisher, Worcester, Mass.

The Pedagogical Seminary. This journal was begun in January, 1891, and is also edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains from 400 to 500 pages. Price, Vols. 1 and 2, $5 each; Vol. 3, $4. Single numbers, $1.50. J. H. Orpha, publisher, Worcester, Mass.

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